SOLICITATION NO. W911WN-04-R-0003

CHARLEROI LOCKS, CONTRACT 1
CHARLEROI LOCKS AND DAM
MONONGAHELA RIVER, PENNSYLVANIA

AMENDMENT

NUMBER 5

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE	PAGE OF PAGES

2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. *(If applicable)*
0005	18-JUN-2004	W81ET4-4058-0100	

6. ISSUED BY	CODE	7. ADMINISTERED BY *(If other than Item 6)*	CODE
US ARMY ENGR DISTRICT PGH 727 WM S MOORHEAD FEDERAL BLDG 1000 LIBERTY AVENUE PITTSBURGH PA 15222-4186 Michele R. Hutfles C02 (412)395-7479	W911WN	US ARMY ENGR DISTRICT PGH 727 WM S MOORHEAD FEDERAL BLDG 1000 LIBERTY AVENUE PITTSBURGH PA 15222-4186	W911WN

8. NAME AND ADDRESS OF CONTRACTOR *(No., street, county, State and ZIP code)*	(X)	9A. AMENDMENT OF SOLICITATION NO.
		W911WN-04-R-0003
	X	9B. DATED *(SEE ITEM 11)* 26-APR-2004
		10A. MODIFICATION OF CONTRACT/ORDER NO.
		10B. DATED *(SEE ITEM 13)*

CODE	FACILITY CODE

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

[X] The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers [ ] is extended, [X] is not extended.
Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:

(a) By completing Items 8 and 15, and returning 1 copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGEMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA *(If required)*

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

(X)	
	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: *(Specify authority)* THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT ADMINISTRATIVE CHANGES *(such as changes in paying office, appropriation date, etc.)* SET FORTH IN ITEM 14, PURSUANT TO AUTHORITY OF FAR 43.103(b).
	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
	D. OTHER *(Specify type of modification and authority)*

E. IMPORTANT: Contractor [ ] is not, [ ] is required to sign this document and return _____ copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION *(Organized by UCF section headings, including solicitation/contract subject matter where feasible.)*

SEE ATTACHED

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER *(Type or print)*		16A. NAME AND TITLE OF CONTRACTING OFFICER *(Type or print)*	
15B. CONTRACTOR/OFFEROR _____ *(Signature of person authorized to sign)*	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA BY _____ *(Signature of Contracting Officer)*	16C. DATE SIGNED

The following changes are made to the Request for Proposal for Charleroi Locks, Contract 1, Charleroi Locks and Dam, Monongahela River, Pennsylvania:

SPECIFICATIONS:

The following specification sections have been revised by Amendment No. 0005. Text revisions for Amendment No. 0005 are indicated within the specification sections by overstrike (deletions) and underscore (additions) and sections which have been revised have a footnote at the bottom which states "Section Revised By Amendment 0005".

SECTION 00010 - SUPPLIES OR SERVICES AND PRICES/COSTS. Delete the bid schedule in its entirety and replace it with the attached revised bid schedule. Note that changes are not highlighted, but are indicated by an asterisk (*) in the margin. THESE REVISED PAGES MUST BE SUBMITTED WITH YOUR OFFER.

Section 00100, Instructions, Conditions and Notice to Bidders
Page 00100-13. Add the following new provision:

52.211-5000 EVALUATION OF SUBDIVIDED ITEMS (MAR 1995)—EFARS

Item No. 0162 is subdivided into two or more estimated quantities and are to be separately priced. The Government will evaluate each of these items on the basis of total price of its sub-items.

Section 00700 – Contract Clauses
Page 00700-28. Add the following new clause:

52.211-5001 VARIATIONS IN ESTIMATED QUANTITIES, SUBDIVIDED ITEMS (MAR 1995)--EFARS

This variation in estimated quantities clause is applicable only to Item No 0162.
(a) Variation from the estimated quantity in the actual work performed under any second or subsequent sub-item or elimination of all work under such a second or subsequent sub-item will not be the basis for an adjustment in contract unit price.
(b) Where the actual quantity of work performed for Item No. 0162 is less than 85% of the quantity of the first sub-item listed under such item, the contractor will be paid at the contract unit price for that sub-item for the actual quantity of work performed and, in addition, an equitable adjustment shall be made in accordance with the clause FAR 52.212-11, Variation in Estimated Quantities.
(c) If the actual quantity of work performed under Items No. 0162 exceeds 115% or is less than 85% of the total estimated quantity of the sub-item under that item and/or if the quantity of the work performed under the second sub-item or any subsequent sub-item under Items No. 0162 exceeds 115% or is less than 85% of the estimated quantity of any such sub-item, and if such variation causes an increase or a decrease in the time required for performance of this contract the

contract completion time will be adjusted in accordance with the clause FAR 52.211-18, Variation in Estimated Quantities.

Replace the following Specification Sections with the attached revised sections:

Section 01180
Section 01270
Section 02260
Section 03015
Section 03050

SECTION 03051. At the end of this section, delete Table A, Table B and Table C, and substitute the attached revised Table A, Table B and Table C. Note that Table D is not revised.

DRAWINGS:

Offerors are urged to compare the computer displayed versions of the contract drawings on the Request For Proposal CdRom with any hard copy reproductions the Offerors produce to ensure that all features have been printed correctly.

Delete the following drawings and substitute the attached revised drawings:

Old Drawing	Revised Drawing
037-LCH-4/43	037-LCH-4/43.1
037-LCH-4/46	037-LCH-4/46.1
037-LCH-20/12	037-LCH-20/12.1
037-LCH-20/15	037-LCH-20/15.1
037-LCH-20/25	037-LCH-20/25.1
037-LCH-19/26	037-LCH-19/26.1
037-LCH-20/40	037-LCH-20/40.1
037-LCH-20/42	037-LCH-20/42.1
037-LCH-20/43	037-LCH-20/43.1
037-LCH-20/46	037-LCH-20/46.1
037-LCH-20/47	037-LCH-20/47.1
037-LCH-20/48	037-LCH-20/48.1
037-LCH-20/49	037-LCH-20/49.1
037-LCH-20/51	037-LCH-20/51.1
037-LCH-20/55	037-LCH-20/55.1
037-LCH-20/56	037-LCH-20/56.1
037-LCH-20/57	037-LCH-20/57.1
037-LCH-20/58	037-LCH-20/58.1
037-LCH-20/59	037-LCH-20/59.1

037-LCH-20/61	037-LCH-20/61.1
037-LCH-20/75	037-LCH-20/75.1
037-LCH-20/82	037-LCH-20/82.1
037-LCH-20/89	037-LCH-20/89.1
037-LCH-20/93	037-LCH-20/93.1
037-LCH-20/94	037-LCH-20/94.1
037-LCH-20/95	037-LCH-20/95.1
037-LCH-24/6	037-LCH-24/6.1
037-LCH-24/16	037-LCH-24/16.1
037-LCH-99/1	037-LCH-99/1.1
037-LCH-99/2	037-LCH-99/2.1
037-LCH-99/6	037-LCH-99/6.1
037-LCH-99/7	037-LCH-99/7.1
037-LCH-103/26	037-LCH-103/26.1
037-LCH-103/27	037-LCH-103/27.1
037-LCH-103/29	037-LCH-103/29.1
037-LCH-103/30	037-LCH-103/30.1
037-LCH-103/31	037-LCH-103/31.1
037-LCH-103/33	037-LCH-103/33.1

Drawing 037-LCH-0/8. Change the drawing number to 037-LCH-0/8.2. In the index, change the drawing numbers for the following drawings as indicated:

Old Drawing Number	New Drawing Number
037-LCH-0/8.2	037-LCH-0/8.3
037-LCH-4/43	037-LCH-4/43.1
037-LCH-4/46	037-LCH-4/46.1
037-LCH-19/26	037-LCH-19/26.1
037-LCH-20/12	037-LCH-20/12.1
037-LCH-20/15	037-LCH-20/15.1
037-LCH-20/25	037-LCH-20/25.1
037-LCH-20/40	037-LCH-20/40.1
037-LCH-20/42	037-LCH-20/42.1
037-LCH-20/43	037-LCH-20/43.1
037-LCH-20/46	037-LCH-20/46.1
037-LCH-20/47	037-LCH-20/47.1
037-LCH-20/48	037-LCH-20/48.1
037-LCH-20/49	037-LCH-20/49.1
037-LCH-20/51	037-LCH-20/51.1
037-LCH-20/55	037-LCH-20/55.1
037-LCH-20/56	037-LCH-20/56.1
037-LCH-20/57	037-LCH-20/57.1
037-LCH-20/58	037-LCH-20/58.1
037-LCH-20/59	037-LCH-20/59.1
037-LCH-20/61	037-LCH-20/61.1

037-LCH-20/75	037-LCH-20/75.1
037-LCH-20/82	037-LCH-20/82.1
037-LCH-20/89	037-LCH-20/89.1
037-LCH-20/93	037-LCH-20/93.1
037-LCH-20/94	037-LCH-20/94.1
037-LCH-20/95	037-LCH-20/95.1
037-LCH-24/6	037-LCH-24/6.1
037-LCH-24/16	037-LCH-24/16.1
037-LCH-99/1	037-LCH-99/1.1
037-LCH-99/2	037-LCH-99/2.1
037-LCH-99/6	037-LCH-99/6.1
037-LCH-99/7	037-LCH-99/7.1
037-LCH-103/26	037-LCH-103/26.1
037-LCH-103/27	037-LCH-103/27.1
037-LCH-103/29	037-LCH-103/29.1
037-LCH-103/30	037-LCH-103/30.1
037-LCH-103/31	037-LCH-103/31.1
037-LCH-103/33	037-LCH-103/33.1

Questions for Clarification:

The following are representative questions received by the Government and responses to those questions:

Q1. Does the contractor have the option to bid the sheet pile seepage cut-off walls without the HP 12x84 guide H-piles? Are the H-piles solely for the contractor's convenience in alignment of the seepage cutoff wall?

A1. For the purposes of the bid preparation, the HP 12x84 sections should be used as detailed in the drawings. After the award, the successful bidder could pursue the use of other guide piles or structural members as detailed in Specifications Section 01330, paragraph 3.5.8 entitled "Deviations". However, the contractor would be responsible for performing all analysis and design and verifying that the original design criteria are satisfied. As currently designed, the H-piles serve two purposes: they are part of the sheet pile cutoff walls and they are intended to be a guide for driving the rest of the sheets. As part of the "Deviation", the contractor could elect to use an alternate guide pile. If an alternate guide pile is used, the sheet pile cutoff walls will be required to be continuous as they currently are with the H-piles in place.

Q2. It appears that Drawing 11/8 does not show the containment area recently constructed in the area designated as Parking Area 2. It appears that very little of this area will actually be available for Contractor use. Please clarify.

A2. The containment referred to are the sedimentation ponds that are part of the Charleroi Site Development Contract. The sedimentation basins are to be removed at or

near the end of the Site Development Contract. Per Section 01100 paragraph 1.5.1 that contract is scheduled to be completed in October of 2004.

Q3 Please clarify what work or material that is shown on Drawings 20/75 and 20/82 is to be included in the contract.

A3 It is intended that only the bold features are to be provided under this contract. “half tone” or “grey-shaded” features will be provided or constructed under separate contract. on Drawing 20/75, only the wall quoin anchors are to be provided.

Q4. Table A in Specification Section 03051 MIX 2 is to be utilized for Large Shafts (Dia. 84”/78”) and other Tremie Concrete. There are no shafts this large on this project. Please clarify that this mix is not to be utilized for the 78”/72” shafts.

A4. That is correct. Mix 2 is not to be used in any shaft under this contract, but will be used in other areas under this contract. Only Mix 1 is to be used for shaft concrete, as indicated in Table B.

Q5. Payment section for the work associated with modification to the existing stub wall indicates that the tremie concrete to fill the culvert is to be included in the LS Item 55. Please verify that the culvert quantity is not included in the Tremie Concrete Item 27.

A5. The tremie concrete to fill the culvert and ports in the stub wall should only be included in bid item 0055. The quantity was incorrectly included in bid item 0027 and has been removed from bid item 0027 under Amendment 0005.

Q6. Will the work associated with the Field Demonstration Item need to be completely removed once all construction methods have been approved?

A6. The Contractor will not be required to remove the demonstration river wall foundation. Demonstration drilled shafts may be reused for the contractor’s convenience as indicated in Section 03015, but they will be required to be removed at the completion of the contract. This has been clarified in Amendment 0005.

Q7. Is it possible to use commercially purchased concrete for the first tremie port at the 14 H-pile supports shown on dwg 19/37?

A7. For this application only, commercially purchased tremie concrete would be acceptable, however it would need to meet the mix design criteria for Mix 17, which was not included in the Tables A thru C at the end of Section 03051. These tables have been revised to include a mix design 17 for this application and are attached to Amendment 0005.

Q8. Does Bid Item 33, Field Demonstrations include payment for all component materials., or are the materials paid under their separate, respective items? (i.e., rebar, cement, piling etc)

A8. Bid Item 0033 is to include payment for all the component materials. This has been clarified in Amendment 0005.

This amendment will be issued via the internet only.

SECTION 00010
SUPPLIES OR SERVICES AND PRICES/COSTS

ITEM	DESCRIPTION	* QUANTITY	U/M	U/P	AMOUNT
0001	REIMBURSEMENT FOR ACTUAL PERFORMANCE AND PAYMENT BONDS PREMIUM (SEE SECTION 00800 PARAGRAPH 52.777-4020)			NOT TO EXCEED	$_____.____
0002	MOBILIZATION AND DEMOBILIZATION	1	LS	SUM	$_____.____
0003	MONTHLY PROGRESS IMAGES	48	MO	$_____.____	$_____.____
0004	CONSTRUCTION PROJECT SCHEDULE	1	LS	SUM	$_____.____
0005	RELOCATE GOVERNMENT TRAILER	1	LS	SUM	$_____.____
0006	FURNISH AND SET UP GOVERNMENT CONSTRUCTION OFFICE	1	LS	SUM	$_____.____
0007	CONCRETE TESTING LAB	1	LS	SUM	$_____.____
0008	OPERATE AND MAINTAIN CONCRETE TESTING LAB	48	MO	$_____.__	$_____.____
0009	TEMPORARY CONSTRUCTION FACILITIES	1	LS	SUM	$_____.____
0010	DREDGING, LOCK AND APPURTENANCES	53,410	CD	$_____.____	$_____.____
0011	DRILLING HOLES IN CONCRETE FOR H-PILES, RIVERWALL STABILIZATION	85	LF	$_____.____	$_____.____
0012	FURNISH AND INSTALL H-PILES, RIVERWALL STABILIZATION	395	LF	$_____.____	$_____.____
0013	DRILLING HOLES IN ROCK FOR ROCK ANCHORS, RIVERWALL STABILIZATION	570	LF	$_____.____	$_____.____
0014	DRILLING HOLES IN CONCRETE FOR ROCK ANCHORS, RIVERWALL STABILIZATION	126	LF	$_____.____	$_____.____
0015	DRILLING AND CASING HOLES IN EARTH FOR ROCK ANCHORS, RIVERWALL STABILIZATION	420	LF	$_____.____	$_____.____
0016	ROCK ANCHORS, RIVERWALL STABILIZATION	1,090	LF	$_____.____	$_____.____
0017	PERFORMANCE TESTS, ROCK ANCHORS, RIVERWALL STABILIZATION	2	EA	$_____.____	$_____.____
0018	PROOF TESTS, ROCK ANCHORS, RIVERWALL STABILIZATION	12	EA	$_____.____	$_____.____
0019	WATERTIGHTNESS TESTING, ROCK ANCHORS, RIVERWALL STABILIZATION	28	EA	$_____.____	$_____.____

	ITEM	DESCRIPTION	* QUANTITY	U/M	U/P	AMOUNT
	0020	PREGROUTING HOLES, ROCK ANCHORS, RIVERWALL STABILIZATION	330	CF	$_____.____	$_____.____
	0021	REDRILLING GROUTED HOLES, ROCK ANCHORS, RIVERWALL STABILIZATION	1,135	LF	$_____.____	$_____.____
	0022	PORTLAND CEMENT	5,150	TN	$_____.____	$_____.____
	0023	POZZOLAN	3,765	TN	$_____.____	$_____.____
	0024	GROUND GRANULATED BLAST FURNACE SLAG	10,897	TN	$_____.____	$_____.____
	0025	SILICA FUME	412	TN	$_____.____	$_____.____
	0026	ANTI-WASHOUT MIXTURE	16,814	GL	$_____.____	$_____.____
*	**0027**	**TREMIE CONCRETE**	**32,205**	**CD**	**$_____.____**	**$_____.____**
	0028	MASS CONCRETE, LOCK WALL MONOLITHS	27,020	CD	$_____.____	$_____.____
	0029	CAST IN PLACE STRUCTURAL CONCRETE, LOCK WALL MONOLITHS	331	CD	$_____.____	$_____.____
	0030	PVC WATERSTOPS	1,100	LF	$_____.____	$_____.____
	0031	COPPER WATERSTOPS	195	LF	$_____.____	$_____.____
	0032	FABRICATION AND INSTALLATION COSTS FOR REINFORCING STEEL AND DOWELS, LOCK WALLS AND APPURTENANCES	2,171,740	LB	$_____.____	$_____.____
	0033	FIELD DEMONSTRATIONS	1	LS	SUM	$_____.____
	0034	FABRICATION AND INSTALLATION COSTS FOR PERMANENT CASING, 54-INCH DIAMETER FOUNDATION DRILLED SHAFTS (48-INCH ROCK SOCKET)	525	LF	$_____.____	$_____.____
	0035	FABRICATION AND INSTALLATION COSTS FOR PERMANENT CASING, 78-INCH DIAMETER FOUNDATION DRILLED SHAFTS (72-INCH ROCK SOCKET)	1,430	LF	$_____.____	$_____.____
	0036	SOIL EXCAVATION, 54-INCH DIAMETER FOUNDATION DRILLED SHAFTS	270	LF	$_____.____	$_____.____
	0037	SOIL EXCAVATION, 78-INCH DIAMETER FOUNDATION DRILLED SHAFTS (72-INCH ROCK SOCKET)	1,026	LF	$_____.____	$_____.____
	0038	ROCK EXCAVATION, 54-INCH DIAMETER FOUNDATION DRILLED SHAFTS (48-INCH ROCK SOCKET)	1,170	LF	$_____.____	$_____.____

ITEM	DESCRIPTION	* QUANTITY	U/M	U/P	AMOUNT
0039	ROCK EXCAVATION, 78-INCH DIAMETER FOUNDATION DRILLED SHAFTS (72-INCH ROCK SOCKET)	4,106	LF	$_____.____	$_____.____
0040	CROSSHOLE SONIC LOGGING (CSL), FOUNDATION DRILLED SHAFTS	144	EA	$_____.____	$_____.____
0041	ACCESS TUBES, CROSSHOLE SONIC LOGGING, FOUNDATION DRILLED SHAFTS	1	LS	SUM	$_____.____
0042	CONCRETE, FOUNDATION DRILLED SHAFTS	6,705	CD	$_____.____	$_____.____
0043	CORING OF FOUNDATION DRILLED SHAFTS, VERIFICATION OF CROSSHOLE SONIC LOGGING RESULTS	2,800	LF	$_____.____	$_____.____
0044	FABRICATION AND INSTALLATION COSTS FOR REINFORCING STEEL, FOUNDATION DRILLED SHAFTS	4,347,400	LB	$_____.____	$_____.____
0045	EXPLORATORY DRILLING, SOIL DRILLING WITHOUT SAMPLING	230	LF	$_____.____	$_____.____
0046	EXPLORATORY DRILLING, SOIL DRILLING WITH SAMPLING	230	LF	$_____.____	$_____.____
0047	EXPLORATORY DRILLING, ROCK DRILLING, WITH CORING	1,090	LF	$_____.____	$_____.____
0048	EXPLORATORY DRILLING, SEALING OF EXPLORATORY HOLES WITH CEMENT GROUT	1,090	LF	$_____.____	$_____.____
0049	EXPLORATORY PILE DRIVING	1	LS	SUM	$_____.____
0050	FABRICATION AND INSTALLATION COSTS FOR SHEET PILE, NON-COFFERBOXES	8,710	LF	$_____.____	$_____.____
0051	FABRICATION AND INSTALLATION COSTS FOR H-PILES, NON-COFFERBOXES	1,010	LF	$_____.____	$_____.____
0052	FURNISH, INSTALL AND REMOVE COFFERBOX PILING	1	LS	SUM	$_____.____
0053	UNDERWATER ALLUVIUM EXCAVATION INSIDE COFFERBOXES	3,400	CD	$_____.____	$_____.____
0054	COFFERBOX DEWATERING	1	LS	SUM	$_____.____

	ITEM	DESCRIPTION	* QUANTITY	U/M	U/P	AMOUNT
	0055	MODIFICATIONS TO EXISTING STUB WALL	1	LS	SUM	$_____.____
	0056	ALTERNATING TREAD STAIRS	1	LS	SUM	$_____.____
	0057	MITER GATE EMBEDDED ANCHORAGES	1	LS	SUM	$_____.____
	0058	FLOATING MOORING BITT ANCHORAGES	1	LS	SUM	$_____.____
	0059	PRECAST CONCRETE EMPTYING CULVERTS	1	LS	SUM	$_____.____
*	**0060**	**CORNER PROTECTION**	**475**	**LF**	**$_____.____**	**$_____.____**
	0061	WALL ARMOR AND MONOLITH JOINT PROTECTION	2,000	LF	$_____.____	$_____.____
	0062	CORNER CASTINGS	10	EA	$_____.____	$_____.____
	0063	ACCESS HATCHES	1	LS	SUM	$_____.____
	0064	GRATING	20	SF	$_____.____	$_____.____
	0065	ALUMINUM PLANKING	1,480	SF	$_____.____	$_____.____
	0066	EQUIPMENT ACCESS AND EMPTYING VALVE ACCESS COVERS	578	SF	$_____.____	$_____.____
	0067	GATE ANCHORAGE RECESS COVER	38	SF	$_____.____	$_____.____
	0068	ALUMINUM RABBET ANGLES	1,225	LF	$_____.____	$_____.____
	0069	CHECK POSTS	8	EA	$_____.____	$_____.____
	0070	LINE HOOKS AND GUARDS	10	EA	$_____.____	$_____.____
	0071	FABRICATION AND INSTALLATION COSTS FOR EMPTYING VALVES AND EMPTYING BULKHEADS	1	LS	SUM	$_____.____
	0072	COMPRESSED AIR AND SERVICE WATER LINES	1	LS	SUM	$_____.____
	0073	ELECTRICAL WORK	1	LS	SUM	$_____.____
	0074	ROCK CONSTRUCTION ENTRANCE, GOVERNMENT FURNISHED DISPOSAL SITE	4	EA	$_____.____	$_____.____
	0075	COAL FINE REMOVAL, GOVERNMENT FURNISHED DISPOSAL SITE	11,400	CD	$_____.____	$_____.____
	0076	OFF-LOADING DOCK IMPROVEMENTS, GOVERNMENT FURNISHED DISPOSAL SITE	1	LS	SUM	$_____.____
	0077	SILT FENCE, GOVERNMENT FURNISHED DISPOSAL SITE	3,680	LF	$_____.____	$_____.____

	ITEM	DESCRIPTION	* QUANTITY	U/M	U/P	AMOUNT
	0078	SUPER SILT FENCE, GOVERNMENT FURNISHED DISPOSAL SITE	1,035	LF	$_____.____	$_____.____
*	**0079**	**GRASS LINED CHANNELS, GOVERNMENT FURNISHED DISPOSAL SITE**	**1,980**	**LF**	**$**_____.____	**$**_____.____
	0080	SEDIMENT BASIN NO. 1, GOVERNMENT FURNISHED DISPOSAL SITE	1	LS	SUM	$_____.____
	0081	CLEANING OF SEDIMENT BASIN NO. 1, GOVERNMENT FURNISHED DISPOSAL SITE	1	LS	SUM	$_____.____
	0082	HAUL ROAD EXCAVATION, GOVERNMENT FURNISHED DISPOSAL SITE	1,325	CD	$_____.____	$_____.____
	0083	CONFINEMENT BERM, GOVERNMENT FURNISHED DISPOSAL SITE	2,280	CD	$_____.____	$_____.____
	0084	HAUL ROAD EMBANKMENTS, FILL, GOVERNMENT FURNISHED DISPOSAL SITE	28,770	CD	$_____.____	$_____.____
	0085	8-INCH AGGREGATE SURFACING, GOVERNMENT FURNISHED DISPOSAL SITE	9,315	SY	$_____.____	$_____.____
	0086	GUIDERAIL, GOVERNMENT FURNISHED DISPOSAL SITE	465	LF	$_____.____	$_____.____
*	**0087**	**DREDGING AT DOCK, GOVERNMENT FURNISHED DISPOSAL SITE**	**4,700**	**CD**	**$**_____.____	**$**_____.____
	0088	SECURITY SIGNS, GOVERNMENT FURNISHED DISPOSAL SITE	1	LS	SUM	$_____.____
*	**0089**	**15-INCH RCP CULVERT, GOVERNMENT FURNISHED DISPOSAL SITE**	**114**	**LF**	**$**_____.____	**$**_____.____
	0090	18-INCH RCP CULVERT, GOVERNMENT FURNISHED DISPOSAL SITE	55	LF	$_____.____	$_____.____
	0091	TEMPORARY DISPOSAL STOCKPILE	44,000	CD	$_____.____	$_____.____
	0092	TEMPORARY SEEDING, GOVERNMENT FURNISHED DISPOSAL SITE	12	AC	$_____.____	$_____.____
	0093	FILTER FABRIC FENCE, 18-INCH HIGH, LEFT BANK BATCH PLANT AREA	1,530	LF	$_____.____	$_____.____
	0094	FILTER FABRIC FENCE, 30-INCH HIGH, LEFT BANK BATCH PLANT AREA	240	LF	$_____.____	$_____.____
	0095	SUPER SILT FENCE, LEFT BANK BATCH PLANT AREA	410	LF	$_____.____	$_____.____

ITEM	DESCRIPTION	* QUANTITY	U/M	U/P	AMOUNT
0096	ROCK CONSTRUCTION ENTRANCE, LEFT BANK BATCH PLANT AREA	2	EA	$_____.____	$_____.____
0097	SITE CLEANUP, CLEARING AND GRUBBING, LEFT BANK BATCH PLANT AREA	1	LS	SUM	$_____.____
0098	CONCRETE FOUNDATION SLABS DEMOLITION AND PLACEMENT, AND EXISTING DEBRIS DISPOSAL, LEFT BANK BATCH PLANT AREA	1	LS	SUM	$_____.____
0099	SITE EARTHWORK, LEFT BANK BATCH PLANT AREA	20,000	CD	$_____.____	$_____.____
0100	GRANULAR FILL MATERIAL, LEFT BANK BATCH PLANT AREA	870	CD	$_____.____	$_____.____
0101	ROCK FILTER OUTLETS AND ASSOCIATED 18-INCH HIGH FILTER FABRIC FENCE, LEFT BANK BATCH PLANT AREA	1	LS	SUM	$_____.____
0102	DIRT-BAG PUMPED SILT CONTROL SYSTEM, LEFT BANK BATCH PLANT AREA	1	LS	SUM	$_____.____
0103	OUTFALL 002, ROCK FILTER, AND RIPRAP EROSION PROTECTION, LEFT BANK BATCH PLANT AREA	1	EA	$_____.____	$_____.____
0104	TRAPEZOIDAL CHANNEL, R-3 RIPRAP LINING, BULKHEAD STRUCTURE AREA, LEFT BANK BATCH PLANT AREA	130	LF	$_____.____	$_____.____
0105	OUTFALL 001, MANHOLE, 48-INCH DIAMETER PRECAST REINFORCED CONCRETE, LEFT BANK BATCH PLANT AREA	1	EA	$_____.____	$_____.____
0106	24-INCH OUTFALL 001 PIPE & FITTINGS, REINFORCED CONCRETE PIPE AND BACKFILL, LEFT BANK BATCH PLANT AREA	70	LF	$_____.____	$_____.____
0107	VALVE STATION MANHOLE, 60-INCH DIAMETER PRECAST REINFORCED CONCRETE, LEFT BANK BATCH PLANT AREA	1	EA	$_____.____	$_____.____
0108	GATE VALVE AND REDUCER COUPLING, LEFT BANK BATCH PLANT AREA	1	EA	$_____.____	$_____.____

ITEM	DESCRIPTION	* QUANTITY	U/M	U/P	AMOUNT
0109	24-INCH, SDR 21 HDPE PIPE FROM VALVE STATION MANHOLE TO INLET NO. 1, LEFT BANK BATCH PLANT AREA	12	LF	$_____.____	$_____.____
0110	INLETS NO. 1, 2 AND 5, PADOT TYPE C, LEFT BANK BATCH PLANT AREA	3	EA	$_____.____	$_____.____
0111	INLETS NOS. 3 AND 4, PADOT TYPE M, LEFT BANK BATCH PLANT AREA	2	EA	$_____.____	$_____.____
0112	24-INCH PE, SMOOTH INTERIOR, STORM SEWER PIPE FROM INLET NO. 1 THROUGH NO. 4, BETWEEN INLET NO. 2 AND NO. 5 AND BETWEEN MANHOLE NO. 1 AND NO. 2, LEFT BANK BATCH PLANT AREA	710	LF	$_____.____	$_____.____
0113	MANHOLES NOS. 1 & 2, 48-INCH DIAMETER PRECAST REINFORCED CONCRETE, LEFT BANK BATCH PLANT AREA	2	EA	$_____.____	$_____.____
0114	PLAIN CONCRETE CURB, INSIDE EDGE OF ACCESS RAMP, LEFT BANK BATCH PLANT AREA	11	CD	$_____.____	$_____.____
0115	CONCRETE PAVEMENT, ACCESS RAMP AND LANDING AREA, LEFT BANK BATCH PLANT AREA	460	CD	$_____.____	$_____.____
0116	TOPSOIL, LEFT BANK BATCH PLANT AREA	2,075	TN	$_____.____	$_____.____
0117	SEEDING, LEFT BANK BATCH PLANT AREA	1.5	AC	$_____.____	$_____.____
0118	TURF REINFORCEMENT MAT, LEFT BANK BATCH PLANT AREA	1	LS	SUM	$_____.____
0119	SOIL-FILLED CELLULAR/GRID CONFINEMENT SYSTEM, LEFT BANK BATCH PLANT AREA	1	LS	SUM	$_____.____
0120	GUIDERAIL, PADOT TYPE 2-SC, LEFT BANK BATCH PLANT AREA	690	LF	$_____.____	$_____.____
0121	CHAIN LINK FENCING, 6-FT HIGH GENERAL SECURITY FENCE, LEFT BANK BATCH PLANT AREA	1,095	LF	$_____.____	$_____.____
0122	CHAIN LINK FENCING, 8-FT HIGH HIGH SECURITY SYSTEM, LEFT BANK BATCH PLANT AREA	500	LF	$_____.____	$_____.____

ITEM	DESCRIPTION	* QUANTITY	U/M	U/P	AMOUNT
0123	MAIN ACCESS GATE, 31-FT MIN OPENING, 6-FT HIGH, GENERAL SECURITY SYSTEM, LEFT BANK BATCH PLANT AREA	1	EA	$_____.____	$_____.____
0124	SLIDING ACCESS GATE, 19-FT WIDE, 8-FT HIGH, HIGH SECURITY SYSTEM, LEFT BANK BATCH PLANT AREA	1	EA	$_____.____	$_____.____
0125	SWINGING ACCESS GATE, 4'-0" WIDE, 6-FT HIGH, GENERAL SECURITY SYSTEM, LEFT BANK BATCH PLANT AREA	1	EA	$_____.____	$_____.____
0126	SWINGING ACCESS GATE, 4'-0" WIDE, 8-FT HIGH, HIGH SECURITY SYSTEM, LEFT BANK BATCH PLANT AREA	1	EA	$_____.____	$_____.____
0127	MODIFICATIONS TO EXISTING GROUNDWATER MONITORING WELLS, CBP-1 AND CBP-2, LEFT BANK BATCH PLANT AREA	1	LS	SUM	$_____.____
0128	BITUMINOUS CONCRETE BASE COURSE (BCBC) , LEFT BANK BATCH PLANT AREA	18,700	SY	$_____.____	$_____.____
0129	BITUMINOUS WEARING COURSE, LEFT BANK BATCH PLANT AREA	18,700	SY	$_____.____	$_____.____
0130	BITUMINOUS BINDER COURSE, LEFT BANK BATCH PLANT AREA	18,700	SY	$_____.____	$_____.____
0131	TRAPEZOIDAL CHANNEL, PAVED LINING, LEFT BANK BATCH PLANT AREA	385	LF	$_____.____	$_____.____
0132	ASPHALT DIVERSION BERM, LEFT BANK BATCH PLANT AREA	2	EA	$_____.____	$_____.____
0133	ASPHALT WEDGE CURB, ID-2 WEARING, LEFT BANK BATCH PLANT AREA	1,860	LF	$_____.____	$_____.____
0134	GRAVEL ACCESS ROAD, LEFT BANK BATCH PLANT AREA	1,528	SY	$_____.____	$_____.____
0135	SEDIMENTATION BASINS NOS. 1 & 2, LEFT BANK BATCH PLANT AREA	1	LS	SUM	$_____.____
0136	CLEANING OF SEDIMENT BASIN NO. 1, LEFT BANK BATCH PLANT AREA	1	LS	SUM	$_____.____
0137	CLEANING OF SEDIMENT BASIN NO. 2, LEFT BANK BATCH PLANT AREA	1	LS	SUM	$_____.____

ITEM	DESCRIPTION	* QUANTITY	U/M	U/P	AMOUNT
0138	PRECAST CONCRETE BLOCK WALL BETWEEN SEDIMENTATION BASIN NO. 1 AND NO. 2, LEFT BANK BATCH PLANT AREA	1	LS	SUM	$_____.____
0139	OUTLET STRUCTURE FROM SEDIMENTATION BASIN NO. 2 TO pH TREATMENT SYSTEM, LEFT BANK BATCH PLANT AREA	1	LS	SUM	$_____.____
0140	OIL/CONTAINMENT BOOM (60-FT LONG), LEFT BANK BATCH PLANT AREA	1	LS	SUM	$_____.____
0141	OPEN GRATE TRENCH, LEFT BANK BATCH PLANT AREA	320	LF	$_____.____	$_____.____
0142	CONCRETE SLABS, BATCH PLANT BIN AREA AND TRUCK TIRE WASH AREA, LEFT BANK BATCH PLANT AREA	360	CD	$_____.____	$_____.____
0143	CONCRETE BATCH PLANT, LEFT BANK BATCH PLANT AREA	1	LS	SUM	$_____.____
0144	SHEET PILE BARRIER, LEFT BANK BATCH PLANT AREA	1	LS	SUM	$_____.____
0145	BULKHEAD STRUCTURE INSTALLATION, LEFT BANK BATCH PLANT AREA	1	LS	SUM	$_____.____
0146	PH MONITORING AND CONTROL SYSTEM, LEFT BANK BATCH PLANT AREA	1	LS	SUM	$_____.____
0147	ENVIRONMENTAL COMPLIANCE MEASUREMENTS, SAMPLING, TESTING AND REPORTING DURING BATCH PLANT OPERATION, LEFT BANK BATCH PLANT AREA	48	MO	$_____.____	$_____.____
0148	ENVIRONMENTAL CONTROL REPRESENTATIVE (ECR) FOR ENVIRONMENTAL COMPLIANCE MONITORING AND EQUIPMENT OPERATION AND MAINTENANCE, LEFT BANK BATCH PLANT AREA AND GOVERNMENT FURNISHED DISPOSAL SITE	48	MO	$_____.____	$_____.____
0149	JET GROUT COLUMNS, COFFERBOX CLOSURES	64	LF	$_____.____	$_____.____
0150	TEST CORE SAMPLES, JET GROUT COLUMNS	16	LF	$_____.____	$_____.____

ITEM	DESCRIPTION	* QUANTITY	U/M	U/P	AMOUNT
0151	STEEL MATERIALS COSTS FOR REINFORCING STEEL AND DOWELS, LOCK WALLS AND APPURTENANCES	2,171,740	LB	$_____.____	$_____.____
0152	STEEL MATERIALS COSTS FOR PERMANENT CASING, 54-INCH DIAMETER FOUNDATION DRILLED SHAFTS (48-INCH ROCK SOCKET)	152,935	LB	$_____.____	$_____.____
0153	STEEL MATERIALS COSTS FOR PERMANENT CASING, 78-INCH DIAMETER FOUNDATION DRILLED SHAFTS (72-INCH ROCK SOCKET)	572,725	LB	$_____.____	$_____.____
0154	DELETED				
0155	STEEL MATERIALS COSTS FOR REINFORCING STEEL, FOUNDATION DRILLED SHAFTS	4,347,400	LB	$_____.____	$_____.____
0156	STEEL MATERIALS COSTS FOR SHEET PILE, NON-COFFERBOXES	575,000	LB	$_____.____	$_____.____
0157	STEEL MATERIALS COSTS FOR H-PILES, NON-COFFERBOXES	115,000	LB	$_____.____	$_____.____
0158	DELETED				
0159	STEEL MATERIALS COSTS FOR EMPTYING VALVES AND EMPTYING BULKHEADS	554,900	LB	$_____.____	$_____.____
0160	MISCELLANEOUS METALS	1	LS	SUM	$_____.____
0161	ENVIRONMENTAL COMPLIANCE MEASUREMENTS, SAMPLING, TESTING AND REPORTING GOVERNMENT FURNISHED DISPOSAL SITE	48	MO	$_____.____	$_____.____
*** 0162AA**	**SEDIMENT REMOVAL, STUB WALL MODIFICATIONS, 0 TO 300 CUBIC YARDS**	**300**	**CD**	**$_____.____**	**$_____.____**
*** 0162AB**	**SEDIMENT REMOVAL, STUB WALL MODIFICATIONS, 301 TO 500 CUBIC YARDS**	**200**	**CD**	**$_____.____**	**$_____.____**
*** 0162AC**	**SEDIMENT REMOVAL, STUB WALL MODIFICATIONS, ALL OVER 500 CUBIC YARDS**	**200**	**CD**	**$_____.____**	**$_____.____**

ITEM	DESCRIPTION	* QUANTITY	U/M	U/P	AMOUNT
	SUBTOTAL, ITEMS 0001 THROUGH **0162AC** INCLUSIVE				$_____.____

ALL QUANTITIES ARE ESTIMATED, EXCEPT WHERE THE UNIT IS GIVEN AS "LS" OR "EA"

NOTE: ALL EXTENSIONS OF THE UNIT PRICES SHOWN WILL BE SUBJECT TO VERIFICATION BY THE GOVERNMENT.

PLEASE DO NOT ROUND OFF TOTALS. IN CASE OF VARIATION BETWEEN THE UNIT PRICE AND THE EXTENSION, THE UNIT PRICE WILL BE CONSIDERED TO BE THE BID. IF A MODIFICATION TO A BID BASED ON UNIT PRICES IS SUBMITTED, WHICH PROVIDES FOR A LUMP SUM ADJUSTMENT TO THE TOTAL ESTIMATED COST, THE APPLICATION OF THE LUMP SUM ADJUSTMENT TO EACH UNIT PRICE IN THE BID SCHEDULE MUST BE STATED. IF IT IS NOT STATED, THE BIDDER AGREES THAT THE LUMP SUM ADJUSTMENT SHALL BE APPLIED ON A PRORATA BASIS TO EVERY UNIT PRICE IN THE BID SCHEDULE.

THE FOLLOWING IS A LIST OF ABBREVIATIONS AND THEIR MEANINGS AS USED IN THE PRICE SCHEDULE UNDER U/M (UNIT OF MEASURE):

AC	ACRES
CD	CUBIC YARD
CF	CUBIC FEET
DA	DAYS
EA	EACH
GL	GALLONS
LB	POUNDS
LF	LINEAR FEET
LS	LUMP SUM
MO	MONTHS
SE	SETS
SF	SQUARE FEET
SY	SQUARE YARDS
TN	TONS

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SECTION 01180

UTILITY COORDINATION

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-- End of Section Table of Contents --

SECTION 01180

UTILITY COORDINATION

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

The locations, use and connections to utilities shall be coordinated with the general requirements contained herein, and in other sections of the Specifications.

1.2 UTILITY SERVICES

Specific requirements for water, electrical and telephone services shall be as specified in the following sections of the Specifications:

Section 01525 TEMPORARY CONSTRUCTION FACILITIES.

Section 01526 GOVERNMENT FACILITIES

1.3 PROTECTION OF UTILITIES

Notwithstanding Section 00700 CONTRACT CLAUSES, paragraph "PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS," the Contractor shall locate and clearly identify all underground and above ground utility lines, wires, cables, pipes, poles, support lines, and culverts, within the Contractor's work areas. The Contractor shall contact the Pennsylvania One Call System at telephone (800) 242-1776 at least three days prior to beginning any Construction activity. The Contractor shall be responsible for any costs for the Pennsylvania One Call System. The Contractor shall conduct his operations such that the utilities are not damaged or disturbed. Any damage to utilities caused by the Contractor's actions shall be repaired by him at no additional expense to the Government. The Contractor shall store materials and equipment in a manner that does not interfere with utility company services or utility company access to the facilities. The Contractor shall relocate any equipment or stockpiles, at no additional cost to the Government, that interfere with utility company operations, emergency repairs, or standard maintenance services.

1.4 LOCATION OF EXISTING LOCK PROJECT UTILITIES

Existing utilities at the existing Lock Project are as shown on the drawings. Regardless of the information provided on the drawings, the Contractor shall verify the total extent of wiring from its source to the fixtures and equipment at the existing Lock, at his expense. The location of these utilities shall be coordinated with the Contracting Officer and the Lockmaster.

1.5 LOCKOUT AND TAGOUT PROCEDURES

Lockout and tagout procedures shall conform to Section 01105 SAFETY AND HEALTH REQUIREMENTS, paragraph "Lockout and Tagout Procedures".

1.6 CONNECTIONS TO MUNICIPAL UTILITY SYSTEMS

All work in connection with connection to existing utility systems shall be coordinated with the appropriate authority. Such connections shall be made in accordance with the requirements of the authority. Costs for all connections shall be be the responsibility of the Contractor.

1.7 UTILITIES POINTS OF CONTACT

The following is a listing of points of contact for some utilities:

UTILITY SERVICE	POINT OF CONTACT
General Utilities Locations	Pennsylvania One Call System (Telephone Requests Only + Fee) Ph (800) 242-1776
Government Lock Project Utilities	Mr. Gary Householder Lockmaster Monongahela River L/D 4 Ph (724) 684-8442
Electric (Both Left And Right Banks)	Allegheny Power 800 Cabin Hill Drive Greensburg, PA 15606-0001 Ph (724) 489-3233
Telephone	Verizon Ph (724) 223-2884
Natural Gas	Dominion Peoples Land Department 1291 W. Main Street Monongahela PA 15063 Ph (724) 292-3417
	Columbia Gas Transmission 4360 Roy Furman Highway Waynesburg, PA 15370 Ph (724) 627-2114 POC Ketih Spires
Sewage (Right Bank)	Mon Valley Sewage Authority PO Box 792 Donora, PA 15033 Ph (724) 379-4141 POC Ben Levendosky
Sewage (Left Bank)	Authority of the Borough of Charleroi 3 McKean Avenue P.O. Box 211 Charleroi, PA 15022 Ph (724) 483-3585 POC Robert Butz
Water (Both Left And Right Banks)	Authority of the Borough of Charleroi 3 McKean Avenue

UTILITY SERVICE	POINT OF CONTACT
	P.O. Box 211 Charleroi, PA 15022 Ph (724) 483-3585 POC Frank Frascatore

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION ~~(Not Applicable)~~

3.1 NATURAL GAS LINE AT GOVERNMENT FURNISHED DISPOSAL SITE

The site plans for the development of the off-loading area at the Government furnished disposal site depict 2 10-inch diameter natural gas lines crossing haul road "A" near the riverbank along with a valve vault near this crossing, and a gas line crossing haul road "B" and haul road "A". The approximate location of these crossings is as shown, and the Contractor shall be responsible to contact the owner, Columbia Gas Transmission, at the point of contact given above in paragraph "UTILITIES POINTS OF CONTACT. The Contractor shall be required to coordinate the construction and use of the haul roads as well as other construciton activities in the vicinity of the crossings with Columbia Gas Transmission, based on the types of activities to be conducted and the size and type of equipment the Contractor proposes to use for this contract. Attached at the end of this Section of the Specifications are Columbia Gas Transmission's "Minimum Guidelines For Construction Activities In The Vicinity Of Gas Pipelines", which are hereby incorporated into the contact.

-- End of Section --

Columbia Gas Transmission Corp.
Minimum guidelines for construction activities in the vicinity of gas pipelines

Columbia Gas Transmission Corp.'s (Columbia) minimum guidelines for construction activities are intended to ensure the safety of the public and preserve the integrity of Columbia's facilities. Columbia will cooperate to the extent possible in the use of property in the vicinity of its facilities, but to protect public safety and assure the nation's continuous supply of energy deliveries, Columbia cannot allow its facilities and attendant property rights to be compromised.

To minimize conflicts and delays, property owners and developers are encouraged to consult Columbia in the design phase of their project and receive approval of their construction plans before obtaining zoning permits and committing to construction schedules.

Construction

No construction or excavation activities of any kind, including blasting, shall be done on Columbia's right of way area before Columbia personnel have established the actual location of all affected facilities and the limits of the ROW area. Columbia personnel must be present during any construction or excavation activities.

Notification

Columbia must be notified at least two working days before construction begins in the vicinity of its facilities. This notification shall be made through the appropriate state one-call notification service, but follow up contact should be made with the local Columbia Gas Transmission office.

Excavation in the vicinity of pipelines

No excavation shall be made on the pipeline right-of-way without prior notification to Columbia through the state one-call notification service. Subsequent follow-up must be made to Columbia to seek approval for the proposed construction. Approved excavations that are done above, below or within three-feet of either side of the pipeline shall be dug using hand tools.

Crossing pipelines with heavy equipment

To adequately protect Columbia pipelines from potential damage by heavy equipment crossing the right-of-way, Columbia may require heavy equipment operators to install mats, dirt pads, or other approved protective materials. The additional over-burden must be removed after construction unless otherwise directed by Columbia personnel.

Blasting

Any blasting proposed within 300 feet of Columbia facilities must have prior written consent by Columbia. Consent must be requested by submitting a blasting plan for evaluation by Columbia personnel. Any required modifications to the blasting plan will be specified by Columbia in writing. The blasting contractor may be required to monitor and record seismic shock at the facilities.

Operating Area of Storage Wells

In order to safely and efficiently operate and maintain Columbia' natural gas storage fields, Columbia requires up to 300-foot or larger clear area around each well. Accordingly, the company requires notification of, and reserves the right to object to, any proposed above-ground or below-ground construction activities or placement of objects closer than 300 feet in any direction of a wellhead.

Rights-of-Way

The requirements listed below are minimum standards that Columbia requires for construction in the vicinity of its pipeline rights-of-way to protect public safety and the integrity of its facilities. A review of individual plans and property rights may reveal more specific requirements.

1. The existing cover over pipelines, which is normally 36-inches, shall be maintained. The minimum earth cover over pipelines at all street and road crossings, including the adjacent ditch line, shall be 36-inches; 60-inches minimum cover shall be maintained at stream and river crossings.
2. Above ground or below ground structures or obstructions of any type shall not be placed within the easement area of any pipeline, which is generally 25 feet each side of the pipeline.
3. Pipeline easements shall not be shared longitudinally with other utilities. All water valves, curb boxes, manholes, etc. must be outside the easement. Other utilities which cross Columbia pipelines must do so at or as near 90 degrees as practical and with a minimum of 12-inches vertical clearance. Any crossing not installed below Columbia's pipelines must have prior written consent from Columbia. Cable or wire utilities must be in conduit the full width of the easement. For safety reasons, all electric and fiber optic lines crossing Columbia's pipelines shall be surrounded with a minimum of six inches of concrete for the full width of the right-of-way. All crossings must be approved by Columbia before installation begins.
4. Roads shall cross pipelines at or as near 90 degrees as practical, but at angles not less than 45 degrees. The entity constructing the street must pay for any measures required by Columbia to protect its pipeline(s). Such protective measures shall be designed and/or approved by Columbia personnel.
5. Paved areas, such as parking lots, shall not be allowed over the easement unless the pavement can be altered so as not to impact the safe and reliable operation and maintenance of Columbia's pipeline. Concrete paving in Columbia's right-of-way is prohibited. Consequently, all plans for pavement within a Columbia right-of-way must be submitted and approved by Columbia personnel before paving can begin.
6. Septic tanks and leach fields should be placed so they drain away from the pipeline where practical. In no case shall they be placed in the easement area.
7. The right-of-way may be planted in lawn and small shrubs (less than 5 feet tall) or may be used for normal agricultural purposes. However, shrubs will not be allowed within 5 feet each side of the pipeline. Shrubs greater than 5 feet tall and trees, including fruit or nut bearing trees of any kind, are prohibited within the right-of-way.
8. Fences that block visual inspection or interfere with access to Columbia's facilities are prohibited within Columbia rights-of-way. Fences permitted by Columbia to cross its rights-of-way must be designed with 12-foot gates centered on the pipelines and must cross at or as near to 90 degrees as possible.

Note: *These guidelines supersede any and all prior guidelines and/or directives pertaining to activities and placements on or near Columbia Gas Transmission facilities. Existence of, or the ramifications from, the implementation of prior guidelines will not dictate, direct or provide for exemption of any of the above guidelines.*

October 3, 2000

For more information, call the appropriate Columbia representative.

Ohio and Pennsylvania:	330-721-4177
West Virginia & Kentucky:	304-373-2403
Delaware, Maryland, North Carolina New Jersey, New York, Virginia:	540-465-6400

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SECTION 01270

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PART 3 EXECUTION (Not Applicable)

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SECTION 01270

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.1 LUMP SUM PAYMENT ITEMS

Payment items for the work of this contract for which contract lump sum payments will be made are listed in the PRICE SCHEDULE and described below. All costs for items of work, which are not specifically mentioned to be included in a particular lump sum payment item, shall be included in the listed lump sum item most closely associated with the work involved. The lump sum price and payment made for each item listed shall constitute full compensation for furnishing all plant, labor, materials, and equipment, and performing any associated Contractor quality control, environmental protection, meeting safety requirements, tests and reports, and for performing all work required for which separate payment is not otherwise provided.

1.1.1 Miscellaneous, Site and Administrative

Lump Sum price items in the PRICE SCHEDULE include:

0002 MOBILIZATION AND DEMOBILIZATION

a. Payment will be made for costs associated with mobilization and demobilization, as defined in Special Clause PAYMENT FOR MOBILIZATION AND DEMOBILIZATION.

b. Unit of measure: Lump Sum (LS).

0004 CONSTRUCTION PROJECT SCHEDULE

c. Payment for this item shall constitute full compensation for preparation and periodic update of a comprehensive project construction schedule as specified in Section 01320 PROJECT SCHEDULE. Payment shall also include all costs for the initial schedule; report preparations; monthly updates; and all other incidental costs to prepare, monitor and update the construction project schedule as specified.

d. Unit of measure: Lump Sum (LS).

1.1.2 Government Facilities

Lump Sum price items in the PRICE SCHEDULE include:

0005 RELOCATE GOVERNMENT TRAILER

0006 FURNISH AND SET UP GOVERNMENT CONSTRUCTION OFFICE

0007 CONCRETE TESTING LAB

a. Payment for these items shall constitute full compensation for all labor, equipment, material and supply costs for performing the work as

shown on the contract drawings and specified in Section 01526 GOVERNMENT FACILITIES. Payment will not be made until the item of work has been satisfactorily completed and accepted, including furnishing and installing equipment as applicable. No separate payment will be made for temporary removal of the chain link fence for installation of the Government office.

b. "CONCRETE TESTING LAB" will include the costs of constructing both the concrete laboratory and curing room buildings.

c. Unit of measure: Lump Sum (LS).

1.1.3 Temporary Construction Facilities

Lump Sum price items in the PRICE SCHEDULE include:

0009 TEMPORARY CONSTRUCTION FACILITIES

a. Payment for this item shall constitute full compensation for all labor, equipment, material and supply costs for completing this item of work as specified in Section 01525 TEMPORARY CONSTRUCTION FACILITIES.

b. Unit of measure: Lump Sum (LS).

1.1.4 Field Demonstrations

Lump Sum price item in the PRICE SCHEDULE include:

0033 FIELD DEMONSTRATIONS

a. Payment for this item shall constitute full compensation for demonstrations of various concrete placements as specified in Section 03015 CONCRETE: FIELD DEMONSTRATIONS, including demonstration drilled shafts, and demonstration~~s of~~ river wall tremie foundation placement~~s~~, and shall include costs of all component materials and construction and testing requirements. ~~and underbase grouting of emptying culverts during monolith construction~~. No additional payment will be made for correcting any part of or replacing any deficient items, and payment will only be made after completion of successful demonstrations which are found to be acceptable by the Government.

b. Unit of measure: Lump Sum (LS).

1.1.5 Access Tubes, Crosshole Sonic Logging

Lump Sum price item in the PRICE SCHEDULE include:

0041 ACCESS TUBES, CROSSHOLE SONIC LOGGING, FOUNDATION DRILLED SHAFTS

a. Payment for this item shall constitute full compensation for all labor, equipment, material and supply costs to furnish and install access tubes for Crosshole Sonic Testing as shown and as specified in SECTION 03820 CONCRETE: DRILLED SHAFTS, and shall also include all costs of removal of excess tubes and backfilling the holes with concrete as required.

b. Unit of measure: Lump Sum (LS).

1.1.6 Dewatering

Lump Sum price items in the PRICE SCHEDULE include:

0054 COFFERBOX DEWATERING

a. Payment for this item shall constitute full compensation for all labor, equipment, material and supply costs for the initial unwatering and continuous dewatering of the area, as shown on the contract drawings and specified in Section 02175 DEWATERING. Cofferbox dewatering shall include costs of dewatering all cofferboxes.

b. Payment for this item shall also include costs for all advanced planning and engineering; and all other incidental costs in connection with these aspects of the work under this contract.

c. Unit of measure: Lump Sum (LS).

1.1.7 Exploratory Pile Driving

Lump Sum price items in the PRICE SCHEDULE include:

0049 EXPLORATORY PILE DRIVING

a. Payment for these items shall constitute full compensation for all labor, equipment, material and supply costs for the required exploratory pile driving tests, as shown on the contract drawings and specified in Section 02013 EXPLORATORY PILE DRIVING. Payment will include completion of all test piles including furnishing test pile and test sheets. Payment shall also include all costs required for all advanced planning and engineering; report preparation; and all other incidental costs to complete the exploratory pile driving as shown and specified.

b. Unit of measure: Lump Sum (LS).

1.1.8 Cofferbox Piling

Lump sum price item listed in the PRICE SCHEDULE include:

0052 FURNISH, INSTALL AND REMOVE COFFERBOX PILING

a. Payment for this item shall constitute full compensation for all labor, equipment, materials and supplies for completing this item of work as shown and as specified. Payments shall include costs for furnishing z-piling, king piles, connectors and fabricated piles, and any special connectors; walers and pipe posts, internal and external struts; and connection to non-cofferbox walls (except that jet grout columns are paid for elsewhere); costs of guide templates; removal of obstructions; pile removal and redriving; cutoff and removal of cofferbox walls as shown; salvage costs for temporary items; and all other incidental costs in connection with this aspect of the work under this contract. Payment for this item shall also include costs for shop and field fabrications; testing of materials and products incorporated into the work; all advanced planning and engineering; and all other incidental costs in connection with this aspect of the work under this contract. The Contractor shall anticipate that 10% of the quantity of piles will hit obstructions, and that this cost shall be included in this item. The Contractor shall anticipate that the final tip elevations of the piling will be based on information gathered from surveys and field measurements and the results of the exploratory drilling and pile driving tests.

b. Unit of measure: Lump Sum (LS).

1.1.9 Stub Wall Modifications

Lump Sum price items in the PRICE SCHEDULE include:

0055 MODIFICATIONS TO EXISTING STUB WALL

a. Payment for this item shall constitute full compensation for all labor, equipment, material and supply costs to complete this item of work, as shown and as specified, except that sediment removal shall be paid for separately. This item shall include all costs to modify the stub wall as shown, including ~~infill with concrete~~filling the culvert and ports with tremie concrete and filling the gallery with standard flowable concrete, and all other modifications shown, and in accordance with Section 02260 STUB WALL MODIFICATIONS.

b. Unit of measure: Lump Sum (LS).

1.1.10 Precast Concrete Items

Lump Sum price items listed in the PRICE SCHEDULE include:

0059 PRECAST CONCRETE EMPTYING CULVERTS

a. Payment for this item shall constitute full compensation for all labor, equipment, material and supply costs to fabricate, deliver and install the precast concrete items as shown on the contract drawings and specified, including, all reinforced precast concrete; steel bars and dowels integral with the items; all miscellaneous embedded items integrally cast directly into the items; and joint materials. Payment shall include the costs of furnishing and installing the structural support bracing systems required to erect the items, and for modifying the drilled shafts to support the bracing. These payments shall also include the costs of fabrication and installation of the tremie closure plates and tremie bulkheads, as well as the grout brackets and steel alignmnet frames for the precast concrete culverts. These payments shall also include all costs required for testing of materials and products incorporated into the work; temporary scaffolding and supports; all advanced planning and engineering; and all other incidental costs to complete these items of work.

b. Payment for the precast emptying culverts shall constitute full compensation for all labor, equipment, material and supply costs to fabricate, deliver and install these items, and shall include test on land prior to final installation.

c. Unit of measure: Lump Sum (LS).

1.1.11 Steel Fabrications

Lump Sum price items in the PRICE SCHEDULE include:

0056 ALTERNATING TREAD STAIRS

0057 MITER GATE GUDGEON EMBEDDED ANCHORAGES

0058 FLOATING MOORING BITT ANCHORAGES

0063 ACCESS HATCHES

0071 FABRICATION AND INSTALLATION COSTS FOR EMPTYING VALVES AND EMPTYING BULKHEADS

a. Payment for these items shall constitute full compensation for all labor, equipment, material and supply costs to fabricate, deliver and install and test these items as shown on the contract drawings and specified, including, all metalwork fabrication, shop assembly, delivery and field erection. These payments shall also include all costs required for testing of materials and products incorporated into the work; required shop and field tests; painting; temporary scaffolds and supports; all advanced planning and engineering; and all other incidental costs to furnish and install the items, as shown on the contract drawings and specified.

b. Payment for the miter gate embedded anchorages shall include all costs of prestressing the anchors during installation between concrete lifts.

c. Materials costs for furnishing the emptying valves and emptying bulkheads will be paid for separately. Payment for emptying valves and bulkheads will also include full compensation for the fabrication, delivery, installation, and testing of the valves and bulkheads and appurtenant items including valves, bulkheads, lifting beam, frames and guides, bonnets, and valve shafts, and all other items associated with the valves and bulkheads, including fabrication and installation of the culvert liner system, including culvert and dewatering pump access pipes and ladders and shall also include the removal of the valves leaves after acceptance, and delivery and off-loading of the valves to the point of storage and designing and constructing a cribbing structure to support the valve leaves.

d. Unit of measure: Lump Sum (LS).

1.1.12 Signs

Lump Sum price items in the PRICE SCHEDULE include:

0088 SECURITY SIGNS, GOVERNMENT FURNISHED DISPOSAL SITE

a. Payment for signs shall constitute full compensation for all labor, equipment, material and supply costs to complete this item of work as shown and specified, including fabrication and installation.

b. Unit of measure: Lump Sum (LS).

1.1.13 Compressed Air and Service Water System

Lump Sum price items in the PRICE SCHEDULE include:

0072 COMPRESSED AIR AND SERVICE WATER LINES

a. Payment for the new compressed air and service water lines shall constitute full compensation for all labor, equipment, material and supply costs to furnish and install the lines as shown and as specified in Section 15480 PIPING SYSTEMS, and all other incidental costs in connection therewith.

b. Unit of measure: Lump Sum (LS).

1.1.14 Electrical Work

Lump Sum price items in the PRICE SCHEDULE include:

0073 ELECTRICAL WORK

a. Payment for electrical work shall include furnishing and installing the conduit, de-icing system and other electrical equipment as shown and as specified in Section 16415 ELECTRICAL WORK.

b. Unit of measure: Lump Sum (LS).

1.1.15 Government Furnished Disposal Site, Site Development

Lump Sum price items in the PRICE SCHEDULE include:

0076 OFF-LOADING DOCK IMPROVEMENTS, GOVERNMENT FURNISHED DISPOSAL SITE

0080 SEDIMENT BASIN NO. 1, GOVERNMENT FURNISHED DISPOSAL SITE

0081 CLEANING OF SEDIMENT BASIN NO. 1, GOVERNMENT FURNISHED DISPOSAL SITE

a. Payment for improving the existing off-loading dock shall constitute full compensation for all labor, equipment, material and supply costs to design and construct any needed improvements to the existing off-loading dock facility as shown on the drawings and as specified in Section 02145 CONSTRUCTION OF DISPOSAL SITE.

b. Payment for constructing the sediment basin No. 1 shall constitute full compensation for all labor, equipment, material and supply costs to construct and maintain the sediment basin, including excavation and filling, geotextile material, liner and liner sand, skimmer and riser system, reno mattress, 12" CMP outfall, and all other costs in connection with it's construction as shown and as specified.

c. Payment for sediment basin cleaning shall constitute full compensation for all labor, equipment, material and supply costs to clean the sediment basin as specified, including removal and disposal of the material, and any other costs in connection with this item of work.

d. Unit of measure: Lump Sum (LS).

1.1.16 Left Bank Batch Plant Area, Site Development

Lump Sum price items in the PRICE SCHEDULE include:

0097 SITE CLEANUP, CLEARING AND GRUBBING, LEFT BANK BATCH PLANT AREA

a. Payment for this item shall constitute full compensation for all labor, equipment, material and supply costs to perform site cleanup activities and clearing and grubbing activities prior to beginning work at the site, except for those items of work which are paid for separately.

b. Unit of measure: Lump Sum (LS).

0098 CONCRETE FOUNDATION SLABS DEMOLITION AND PLACEMENT, AND EXISTING DEBRIS DISPOSAL, LEFT BANK BATCH PLANT AREA

a. Payment for this item shall constitute full compensation for all labor, equipment, material and supply costs to demolish and remove the feature as indicated and specified to the extent shown, and to protect adjacent features to remain. Removal and disposal of debris from the left bank batch plant area shall also include demolition of existing concrete slabs and foundations and incorporating the resulting rubble into the general fill for the site as specified in Section 02040 DISPOSAL OF MATERIALS.

b. Unit of measure: Lump Sum (LS).

0101 ROCK FILTER OUTLETS AND ASSOCIATED 18-INCH HIGH FILTER FABRIC FENCE, LEFT BANK BATCH PLANT AREA

a. Payment for this item shall constitute full compensation for all labor, equipment, material and supply costs to furnish and install the rock filter outlets and filter fabric fence as shown and specified.

b. Unit of measure: Lump Sum (LS).

0102 DIRT-BAG PUMPED SILT CONTROL SYSTEM, LEFT BANK BATCH PLANT AREA

a. Payment for this item shall constitute full compensation for all labor, equipment, material and supply costs to develop, furnish, maintain and remove the dirt-bag pumped silt control system as shown and as specified.

b. Unit of measure: Lump Sum (LS).

0118 TURF REINFORCEMENT MAT, LEFT BANK BATCH PLANT AREA

a. Payment for this item shall constitute full compensation for all labor, equipment, material and supply costs in connection with completing this item of work as shown and specified, excluding the amount required for overlaps.

b. Unit of measure: Lump Sum (LS).

0119 SOIL-FILLED CELLULAR/GRID CONFINEMENT SYSTEM, LEFT BANK BATCH PLANT AREA

a. Payment for this item shall constitute full compensation for all labor, equipment, material and supply costs to complete this item of work, including furnishing, placing and installing the cellular/grid confinement system as shown and as specified.

b. Unit of measure: Lump Sum (LS).

0127 MODIFICATIONS TO EXISTING GROUNDWATER MONITORING WELLS, CBP-1 AND CBP-2, LEFT BANK BATCH PLANT AREA

a. Payment for this item shall constitute full compensation for all labor, equipment, material and supply costs to complete this item of work, including constructing the monitoring wells at the left bank batch plant area as shown and as specified.

b. Unit of measure: Lump Sum (LS).

0135 SEDIMENTATION BASINS NOS. 1 & 2, LEFT BANK BATCH PLANT AREA

a. Payment for these items shall constitute full compensation for all

labor, equipment, material and supply costs to construct and maintain the sedimentation basins as shown and specified.

b. Unit of measure: Lump Sum (LS).

0136 CLEANING OF SEDIMENT BASIN NO. 1, LEFT BANK BATCH PLANT AREA

0137 CLEANING OF SEDIMENT BASIN NO. 2, LEFT BANK BATCH PLANT AREA

a. Payment for these items shall constitute full compensation for all labor, equipment, material and supply costs to periodically clean the sedimentation basins and dispose of the accumulated sediment as shown and specified.

b. Unit of measure: Lump Sum (LS).

0138 PRECAST CONCRETE BLOCK WALL BETWEEN SEDIMENTATION BASIN NO. 1 AND NO. 2, LEFT BANK BATCH PLANT AREA

0139 OUTLET STRUCTURE FROM SEDIMENTATION BASIN NO. 2 TO pH TREATMENT SYSTEM, LEFT BANK BATCH PLANT AREA

a. Payment for this item shall constitute full compensation for all labor, equipment, material and supply costs to furnish and install the outlet structures as shown and as specified.

b. Unit of measure: Lump Sum (LS).

0140 OIL/CONTAINMENT BOOM (60-FT LONG), LEFT BANK BATCH PLANT AREA

a. Payment for this item shall constitute full compensation for all labor, equipment, material and supply costs to furnish an oil/containment boom as shown and specified.

b. Unit of measure: Lump Sum (LS).

0143 CONCRETE BATCH PLANT, LEFT BANK BATCH PLANT AREA

a. Payment for this item shall constitute full compensation for all labor, equipment, material and supply costs to furnish, construct, outfit and maintain the concrete batch plant as shown and as specified, except for those items which are paid for separately.

b. Unit of measure: Lump Sum (LS).

0144 SHEET PILE BARRIER, LEFT BANK BATCH PLANT AREA

0145 BULKHEAD STRUCTURE INSTALLATION, LEFT BANK BATCH PLANT AREA

a. Payment for these items shall constitute full compensation for all labor, equipment, material and supply costs to design and install these items as shown and as specified in Section 01526 GOVERNMENT FACILITIES, and shall also include all costs for conducting any subsurface exploration, excavation or pre-excavation, and all other incidental costs to construct these items.

b. The costs for the bulkhead structure shall also include all costs to dredge the area as determined by the Contractor to be necessary for

navigation between the Left Bank area and Charleroi Locks and Dam area.

c. Unit of measure: Lump Sum (LS).

0146 PH MONITORING AND CONTROL SYSTEM, LEFT BANK BATCH PLANT AREA

a. Payment for this item shall constitute full compensation for all labor, equipment, material and supply costs to complete this item of work, including furnishing, installing, operating and maintaining a pH monitoring and control system; which shall include; disposal and replenishment of any consumable materials or chemicals; testing and analysis of influent and effluent as specified, and the reporting of test results.

b. Unit of measure: Lump Sum (LS).

1.1.17 Miscellaneous Metals

Unit price item listed in the PRICE SCHEDULE include:

0160 MISCELLANEOUS METALS

a. Payment for this item shall constitute full compensation for all costs necessary to complete this items of work, including fabricating, delivering, and installation, complete as shown on the contract drawings, including anchorage, welding, and painting, and all other costs associated with this items.

b. Miscellaneous metal includes all metalwork, regardless of material type, for which payment is not specifically stated to be made elsewhere, and shall include, but is not limited to: electrical hand hole cover; precast beam supports at monolith R-*; wall quoin anchors; monorail hoist beam supports; automatic gate latches in the miter gate monoliths; and all other metalwork not specifically stated to be made elsewhere. Miscellaneous metal shall also include all anchor bolts, and other connection hardware, for which payment is not specifically stated to be made elsewhere, and which are necessary to install items on top of lock walls.

c. Measurement of corner castings will be by the number of corner castings actually furnished and installed. No separate measurement will be made for anchorages.

d. Unit of Measure: Linear Feet (LF) and Each (EA).

1.2 UNIT PRICE PAYMENT ITEMS

Payment items for the work of this contract on which the contract progress payments will be based are listed in the PRICE SCHEDULE and described below. The unit price and payment made for each item listed shall constitute full compensation for furnishing all plant, labor, materials, and equipment, and performing any associated Contractor quality control, environmental protection, meeting safety requirements, tests and reports, and for performing all work required for each of the unit price items.

1.2.1 Administrative Costs

Unit price items in the PRICE SCHEDULE include:

0003 MONTHLY PROGRESS IMAGES

0147 ENVIRONMENTAL COMPLIANCE MEASUREMENTS, SAMPLING, TESTING AND REPORTING DURING BATCH PLANT OPERATION, LEFT BANK BATCH PLANT AREA

0148 ENVIRONMENTAL CONTROL REPRESENTATIVE (ECR) FOR ENVIRONMENTAL COMPLIANCE MONITORING AND EQUIPMENT OPERATION AND MAINTENANCE, LEFT BANK BATCH PLANT AREA AND GOVERNMENT FURNISHED DISPOSAL SITE

0161 ENVIRONMENTAL COMPLIANCE MEASUREMENTS, SAMPLING, TESTING AND REPORTING GOVERNMENT FURNISHED DISPOSAL SITE

a. Payment for monthly progress images shall constitute full compensation for all labor, equipment, material and supply costs for furnishing monthly digital progress images, as specified in Section 01380 PROGRESS PHOTOGRAPHS.

b. Payment for environmental compliance measurements, sampling, testing and reporting shall constitute full compensation for all labor, equipment, material and supply costs for performing the specified actions within the established deadlines.

c. Measurement for environmental control representative shall be the number of months this individual is working and actually performing the required duties specified in Section 01451 CONTRACTOR QUALITY CONTROL in a manner satisfactory to the Contracting Officer.

d. Unit of measure: Months (MO).

1.2.2 Concrete Testing Lab

Unit price items listed in the PRICE SCHEDULE include:

0008 OPERATE AND MAINTAIN CONCRETE TESTING LAB

a. Payment for this item shall constitute full compensation for all labor, equipment, material and supply costs to operate and maintain the concrete testing lab, including maintenance and repair of all equipment and utilities.

b. Unit of measure: Months (MO).

1.2.3 Dredging and Underwater Excavation

Unit price items in the PRICE SCHEDULE include:

0010 DREDGING, LOCK AND APPURTENANCES

0087 DREDGING AT DOCK, GOVERNMENT FURNISHED DISPOSAL SITE

a. Payment for these items shall constitute full compensation for all labor, equipment, material and supply costs for performing the work including: transporting the materials to the disposal site and off-loading the material at the off-loading ramp at the Government furnished disposal site; performing measurements for payment; and all other incidental costs in connection with these aspects of the work under this contract.

Payment for for hauling and depositing the materials at the designated areas at the disposal site will be paid for separately.

b. The unit of measurement for these items of work shall be cubic yards. All measurement for payment will be based on information gathered from

surveys (soundings) made at the project site prior to the commencement of excavation operations and again following the completion of excavation. Areas sounded more than 30 days prior to excavation shall be re-sounded if requested by the Government. The Contractor shall notify the Contracting Officer at least 2 days before sounding is made. No measurement will be made for removal of any materials beyond that indicated on the contract drawings and tolerances described on the plans and in the specifications. The Contractor shall sound the riverbed over the area to be excavated by a method and with equipment acceptable to the Contracting Officer. Any areas not conforming with the specified tolerances shall be corrected and resounded, at the Contractor's expense. The Contractor shall perform additional soundings as necessary during the progress of the work to verify depths. All sounding data shall be furnished to the Contracting Officer promptly after the information has been obtained and compiled. Initial soundings shall constitute the original cross sections from which all measurements will be based to calculate the quantity of excavation accomplished, without regard to any changes in the surface that may occur during the performance of the work. The second set of soundings shall constitute the final cross-sections from which measurement will be made, and shall be used to verify that the specified bottom elevations and slopes have been achieved. However, no measurement for payment will be made for any material over-dredged beyond that permitted by the allowable tolerances for the specified bottom elevation or specified side slopes. Unless otherwise specified and/or approved, quantities shall be calculated in cubic yards by the average end area method based on the initial and final soundings.

c. The Contractor is responsible for any additional dredging or excavation required to bring the area within the tolerances specified or shown prior to beginning any work upon which the excavation depends at no additional cost to the Government, and no additional measurement or payment will be made for such additional dredging or excavation.

d. Unit of measure: Cubic Yards (CD).

1.2.4 H-Piles for River Wall Stabilization

Unit price items listed in the PRICE SCHEDULE include:

0011 DRILLING HOLES IN CONCRETE FOR H-PILES, RIVERWALL STABILIZATION

0012 FURNISH AND INSTALL H-PILES, RIVERWALL STABILIZATION

a. Payment for drilling holes in concrete for the H-piles shall constitute full compensation for all labor, equipment, material and supply costs to drill the holes through the reinforced concrete cap in the diaphragm support cells, as shown on the contract drawings. Payment shall also include costs for guide templates; disposal of cored material; performing measurements for payment; all advanced planning and engineering; and all other incidental costs in connection with these aspects of the work under this contract.

b. Payment for furnishing and installing the H-piles shall constitute full compensation for all labor, equipment, material and supply costs for the steel H-piles, as shown on the contract drawings and specified in Section 02456 STEEL H-PILES. Payment shall include test pile and production piles. Payment for this item shall also include costs for pile driving tests; pile driving points; shop and field fabrications of cover plates and beveled plates; backfilling around the H-piles in the diaphragm support cell

concrete cap with tremie concrete; performing measurements for payment; testing of materials and products incorporated into the work; all advanced planning and engineering; and all other incidental costs in connection with these aspects of the work under this contract.

c. All measurements shall be made in the presence of the Contracting Officer's Authorized Representative (COAR). The Contracting Officer shall approve all methods and procedures for quantity surveys.

d. The unit of measurement for concrete drilling will be based on information gathered from surveys and field measurements. Measurements shall be the actual linear feet drilled through the diaphragm cell concrete cap and accepted by the Contracting Officer..

e. The unit of measurement for steel H-piles will be based on information gathered from surveys and field measurements. Measurements shall be the actual linear feet of H-Piles installed, and accepted by the Contracting Officer. The Contracting Officer shall approve all methods and procedures for quantity surveys. No separate measurement or payment will be made for pile cut-offs or splices. No separate measurement or payment will be made for backfilling around the H-piles with tremie concrete

f. Unit of measure: Linear Feet (LF).

1.2.5 Rock Anchors

Unit price items listed in the PRICE SCHEDULE include:

0013 DRILLING HOLES IN ROCK FOR ROCK ANCHORS, RIVERWALL STABILIZATION

0014 DRILLING HOLES IN CONCRETE FOR ROCK ANCHORS, RIVERWALL STABILIZATION

0015 DRILLING AND CASING HOLES IN EARTH FOR ROCK ANCHORS, RIVERWALL STABILIZATION

0016 ROCK ANCHORS, RIVERWALL STABILIZATION

0017 PERFORMANCE TESTS, ROCK ANCHORS, RIVERWALL STABILIZATION

0018 PROOF TESTS, ROCK ANCHORS, RIVERWALL STABILIZATION

0019 WATERTIGHTNESS TESTING, ROCK ANCHORS, RIVERWALL STABILIZATION

0020 PREGROUTING HOLES, ROCK ANCHORS, RIVERWALL STABILIZATION

0021 REDRILLING GROUTED HOLES, ROCK ANCHORS, RIVERWALL STABILIZATION

a. Payment for drilling will be made per linear foot for drilling in rock or concrete, regardless of the method used.

b. Drilling and casing holes in earth will be measured for payment to the nearest foot, based upon the linear feet of casing installed in accordance with the specifications.

c. Payment for pre-grouting rock anchor holes which fail the water-tightness test shall be made per actual cubic feet of cement grout that is actually injected into the anchor hole as specified.

d. Payment for redrilling will be made per actual linear feet hole actually drilled in grout from the specified pre-grout packer location to the bottom of the hole.

e. Payment for water-tightness tests of the prestressed anchor holes will be made per each test performed, including all costs in connection with performing the water-tightness tests as specified.

f. Payment for installation of production rock anchors will be made per linear foot of drill hole for each anchor and shall constitute full compensation for all costs in connection with fabricating, furnishing, and installing the rock anchors, including grouting, and stressing, and all other costs in connection therewith not covered elsewhere as shown on the drawings and as specified.

g. All measurements shall be made in the presence of the Contracting Officer's Authorized Representative (COAR).

h. Drilling holes through concrete and rock will be measured for payment in accordance with the actual number of linear feet drilled, except that length of hole over-drilled to compensate for failure to extract cuttings or length of hole drilled but rejected because of alignment failure will not be included for measurement.

i. Drilling and casing holes in earth for rock anchors will be measured for payment to the nearest foot, based upon the linear feet casing installed in accordance with the specifications.

j. Measurement of rock anchors will be made by the linear foot of hole drilled for the rock anchors as specified.

k. Performance Tests will be measured based upon the number of tests performed on anchors which are accepted in accordance with the specifications.

l. Proof Tests will be measured based upon the number of tests performed on anchors which are accepted in accordance with the specifications.

m. Watertightness Testing will be measured for payment based upon the number of watertightness tests actually performed at the direction of the Contracting Officer and in accordance with the specifications or as otherwise required.

n. Pregrouting Holes will be measured for payment based upon the cubic feet of cement grout that were actually injected into the anchor hole as specified.

o. Redrilling holes through pre-grouted holes will be measured by the number of linear feet of hole acceptably redrilled from the packer location to the required bottom of hole.

p. Final installation of the rock anchors will require the construction of a localized dewatering box or boxes as specified in Section 02490 RIVER WALL INCLINED ROCK ANCHORS. No separate payment will be made for the dewatering box(es) and all such costs shall be included in the contract price for "ROCK ANCHORS, RIVERWALL STABILIZATION".

q. Units of measure: linear feet/cubic feet/each.

1.2.6 Concrete Materials

Unit price items listed in the PRICE SCHEDULE include:

0022 PORTLAND CEMENT

a. Payment will be made at the contract price per ton, which price will include the cost of required unloading, hauling, handling, and storage at the site, of all portland cement used in the work, except for that used in precast items, which will be included in cost of the precast items.

b. The quantity of portland cement to be paid for will be the number of tons of portland cement used unless specifically excepted, wasted, or used for the convenience of the Contractor. The quantity to be paid for will be determined by multiplying the actual (within a tolerance of $\pm$ 1% from the mix design weight) batch weight of portland cement in each type of concrete used by the number of batches of concrete types placed within the pay lines of the structure, and dividing by 2,000.

c. Unit of measure: Tons (TN).

0023 POZZOLAN

a. Payment will be made at the contract price per ton which price will include the cost of required unloading, hauling, handling, and storage at the site of all pozzolan used in the work, except for that used in precast items, which will be included in cost of the precast items.

b. The quantity of pozzolan to be paid for will be the number of tons of pozzolan used unless specifically excepted, wasted, or used for the convenience of the Contractor. The quantity to be paid for will be determined by multiplying the actual (within a cumulative weight tolerance of $\pm$ 1% from the mix design weight if cement and pozzolan are batched cumulatively or $\pm$ 1% if weighed separately) batch weight of pozzolan in each type of concrete used by the number of batches of concrete of the types placed within the pay lines of the structure, and dividing by 2,000

c. Unit of measure: Tons (TN).

0024 GROUND GRANULATED BLAST FURNACE SLAG

a. Payment will be made at the contract price per ton, which price will include the cost of required unloading, hauling, handling, and storage at the site, of all ground granulated blast furnace slag (GGBF) used in the work, except for that used in precast items, which will be included in cost of the precast items.

b. The quantity of GGBF to be paid for will be the number of tons of ground granulated blast furnace slag (GGBF) used unless specifically excepted, wasted, or used for the convenience of the Contractor. The quantity to be paid for will be determined by multiplying the actual (within a tolerance of $\pm$ 1% from the mix design weight) batch weight of GGBF in each type of concrete used by the number of batches of concrete types placed within the pay lines of the structure, and dividing by 2,000.

c. Unit of measure: Tons (TN).

0025 SILICA FUME

a. Payment will be made at the contract price per ton, which price will include the cost of required unloading, hauling, handling, and storage at the site, of all silica fume used in the work, except for that used in precast items, which will be included in cost of the precast items.

b. The quantity of silica fume to be paid for will be the number of tons of silica fume used unless specifically excepted, wasted, or used for the convenience of the Contractor.

c. Unit of measure: Tons (TN).

0026 ANTI-WASHOUT MIXTURE

a. Payment will be made at the contract price per gallon, which price will include the cost of required unloading, hauling, handling, and storage at the site, of all anti-washout mixture used in the work, except for that used in precast items, which will be included in cost of the precast items.

b. The quantity of anti-washout mixture to be paid for will be the number of gallons of anti-washout mixture used unless specifically excepted, wasted, or used for the convenience of the Contractor.

c. Unit of measure: Gallons (GL).

1.2.7 Concrete Placement

Unit price items listed in the PRICE SCHEDULE include:

0027 TREMIE CONCRETE

0028 MASS CONCRETE, LOCK WALL MONOLITHS

0029 CAST IN PLACE STRUCTURAL CONCRETE, LOCK WALL MONOLITHS

0042 CONCRETE, FOUNDATION DRILLED SHAFTS

0114 PLAIN CONCRETE CURB, INSIDE EDGE OF ACCESS RAMP, LEFT BANK BATCH PLANT AREA

0115 CONCRETE PAVEMENT, ACCESS RAMP AND LANDING AREA, LEFT BANK BATCH PLANT AREA

0143 OPEN GRATE TRENCH, LEFT BANK BATCH PLANT AREA

0144 CONCRETE SLABS, BATCH PLANT BIN AREA AND TRUCK TIRE WASH AREA, LEFT BANK BATCH PLANT AREA

a. Payment for these items will be made at the respective contract prices per cubic yard, which prices shall include the cost of all labor, materials, and the use of all equipment and tools required to complete the concrete work; except the cement, pozzolan, ground granulated blast furnace slag, silica fume, anti-washout mixture, reinforcement, and embedded parts that are specified to be paid for separately.

b. Pay lines for concrete structures are the neat lines of the structures as shown on the drawings. Measurement of concrete shall be made on the basis of the actual volume of concrete within the pay lines of the structures as indicated on the drawings. Measurement of concrete placed against the sides of any excavation without the use of intervening forms

shall be made only within the pay lines of the structure, and within the tolerances specified. No measurement will be made of concrete placed outside the tolerances specified or for the excavation unless otherwise approved by the Contracting Officer. No deduction shall be made for rounded or beveled edges or space occupied by metal work, reinforcing steel, electrical conduits or other items, nor for voids or embedded items that are either less than 5 cubic feet in volume or 1 square foot in cross section.

c. Payment for tremie concrete and cast in place structural concrete will not include costs of filling the stub wall culvert and ports with tremie concrete or filling the gallery with standard flowable concrete. These costs shall be included in the bid item for "MODIFICATIONS TO EXISTING STUB WALL".

~~c~~d. Payment for the open grate trench will also include costs of constructing the concrete trench and furnishing and installing the trench grating.

~~d~~e. Measurement for the open grate trench will be made by the linear feet of trench constructed and accepted.

~~e~~f. Unit of measure: Cubic Yards (CD) and Linear Feet (LF).

1.2.8 Reinforcing Steel

Unit price items listed in the PRICE SCHEDULE include:

0032 FABRICATION AND INSTALLATION COSTS FOR REINFORCING STEEL AND DOWELS, LOCK WALLS AND APPURTENANCES

0044 FABRICATION AND INSTALLATION COSTS FOR REINFORCING STEEL, FOUNDATION DRILLED SHAFTS

a. Payment for fabricating and installing reinforcing steel and dowels shall constitute full compensation for fabricating and installing the reinforcing as shown and specified. Materials costs for furnishing these items will be paid for separately. Payment shall include all labor, equipment, materials and supplies to complete these items of work, including drilling and grouting holes for dowels as indicated. Payment will not include the amount of steel reinforcing used in precast concrete items.

b. Concrete reinforcing and dowels will be measured for payment by the pound in place. The measured lengths will be converted to weights for the size of bars listed by the use of the nominal weights per lineal foot specified in the respective material specifications. Steel in laps indicated on the drawings or required by the Contracting Officer will be paid for at the contract unit price. No payment will be made for the additional steel in laps which are authorized for the convenience of the Contractor.

c. Unit of measure: Pounds (LB).

1.2.9 Excavation and Grading

Unit price items listed in the PRICE SCHEDULE include:

0075 COAL FINE REMOVAL, GOVERNMENT FURNISHED DISPOSAL SITE

0082 HAUL ROAD EXCAVATION, GOVERNMENT FURNISHED DISPOSAL SITE

0099 SITE EARTHWORK, LEFT BANK BATCH PLANT AREA

a. Payment for these items shall constitute full compensation for all costs in connection with completing these items of work.
Payment for the coal fine removal shall include all advanced planning and engineering, and all costs in connection with removal, and disposal or processing of this material at a permitted facility as specified.

b. These items shall be measured by the cubic yard within the limits shown on the drawings, or as otherwise specified. Measurement shall be made by taking cross-sections before and after excavation or grading is performed and calculating the volume by the average-end-area method. Cross sections shall be taken before and after excavation at the same stations as the sections shown on the contract drawings or as may be additionally required by the Contracting Officer, and shall be performed in the presence of the Contracting Officer or his Authorized Representative, unless otherwise waived. Volume computations shall be performed by the Contractor, and copies of all cross section data and computations shall be submitted to the Contracting Officer.

c. Unit of Measure: Cubic Yards (CD).

1.2.10 Temporary Disposal Stockpile

Unit price items in the PRICE SCHEDULE include:

0091 TEMPORARY DISPOSAL STOCKPILE

a. Payment for this item shall constitute full compensation for all labor, equipment, material and supply costs for performing the work including: transporting and depositing the materials from the off-loading ramp to the designated disposal area; control of effluents from the Contractor's operations; performing measurements for payment; and all other incidental costs in connection with these aspects of the work under this contract.

This item includes the material delivered to the off-loading ramp which will not be used in the construction of confinement berm and embankments.

b. This item shall be measured by the cubic yard within the limits shown on the drawings, or as otherwise specified. The Contracting Officer shall determine the frequency of surveying and approve all methods of measurement. Measurement shall be made by taking cross-sections before and after placement and compaction is performed and calculating the volume by the average-end-area method. Cross sections shall be taken before and after placement at the same stations as the sections shown on the contract drawings or as may be additionally required by the Contracting Officer, and shall be performed in the presence of the Contracting Officer or his Authorized Representative, unless otherwise waived. Volume computations shall be performed by the Contractor, and copies of all cross section data and computations shall be submitted to the Contracting Officer.

c. Unit of measure: Cubic Yards (CD).

1.2.11 Rock, Stone and Riprap

Unit price items listed in the PRICE SCHEDULE include:

0103 OUTFALL 002, ROCK FILTER, AND RIPRAP EROSION PROTECTION, LEFT BANK BATCH PLANT AREA

0104 TRAPEZOIDAL CHANNEL, R-3 RIPRAP LINING, BULKHEAD STRUCTURE AREA, LEFT BANK BATCH PLANT AREA

a. Payment for these items shall constitute full compensation for all costs in connection with completing these items of work including furnishing and placing the specified material to the lines and grades shown, and as specified.

b. Rock lined channels and gabion mattresses shall be measured by the linear feet of stone placed as shown and as specified. Rock filter shall be measured for payment by the number of such structures placed as shown and as specified.

c. Units of Measure: Cubic Yards (CD), Linear Feet (LF), Each (EA) and Tons (TN).

1.2.12 Waterstops

Unit price items listed in the PRICE SCHEDULE include:

0030 PVC WATERSTOPS

0031 COPPER WATERSTOPS

a. Payment for waterstops shall constitute full compensation for all labor, equipment, material and supply costs to furnish and install waterstops as shown and as specified.

b. Waterstops will be measured for payment by the linear foot in place. No allowance will be made for laps.

c. Unit of measure: Linear Feet (LF)

1.2.13 Drilled Shafts

Unit price items listed in the PRICE SCHEDULE include:

0034 FABRICATION AND INSTALLATION COSTS FOR PERMANENT CASING, 54-INCH DIAMETER FOUNDATION DRILLED SHAFTS (48-INCH ROCK SOCKET)

0035 FABRICATION AND INSTALLATION COSTS FOR PERMANENT CASING, 78-INCH DIAMETER FOUNDATION DRILLED SHAFTS (72-INCH ROCK SOCKET)

0036 SOIL EXCAVATION, 54-INCH DIAMETER FOUNDATION DRILLED SHAFTS

0037 SOIL EXCAVATION, 78-INCH DIAMETER FOUNDATION DRILLED SHAFTS (72-INCH ROCK SOCKET)

0038 ROCK EXCAVATION, 54-INCH DIAMETER FOUNDATION DRILLED SHAFTS (48-INCH ROCK SOCKET)

0039 ROCK EXCAVATION, 78-INCH DIAMETER FOUNDATION DRILLED SHAFTS (72-INCH ROCK SOCKET)

0040 CROSSHOLE SONIC LOGGING (CSL), FOUNDATION DRILLED SHAFTS

0043 CORING OF FOUNDATION DRILLED SHAFTS, VERIFICATION OF CROSSHOLE SONIC LOGGING RESULTS

a. Payment for the above items will be made for costs associated with completion of the drilled shafts, including all costs of equipment,labor, and supplies to complete the required work as indicated on the drawings. No separate payment will be made for accessories and payment shall be included in the contract unit price for the items of work to which the accessories are incidental. Payment for items measured by each shall include all costs associated with that item as installed or completed.

b. Measurements shall be based on the results of prerequisite exploratory borings.

c. Measurements for soil excavation will be to the nearest linear foot, based on the length actually drilled through overburden to the top of rock. Measurements will be made from the top surface of the riverbed to the point at which drilling in rock begins. Top of rock shall be established from the results of the exploratory borings (See Section 02012 EXPLORATORY DRILLING).

d. Measurements for rock excavation will be to the nearest linear foot, based on the length actually drilled through rock to the final tip elevation. Top of rock and final tip elevations shall be established from the results of the exploratory borings (See Section 02012 EXPLORATORY DRILLING).

e. Materials costs for furnishing permanent casing will be paid for separately. Measurements for permanent steel casing shall be to the nearest linear foot, based on the actual length of permanent casing in-place from the tip elevation to the final permanent cutoff elevation. No measurement will be made for casing above the cutoff elevation. No separate payment will be made for cut-off or splicing of permanent steel casings. Lengths of casing shall be ordered based on the results of the exploratory borings (See Section 02012 EXPLORATORY DRILLING).

f. Measurements for crosshole sonic logging (CSL) shall be the number of shafts on which crosshole sonic logging has been performed.

g. Coring of foundation drilled shafts to verify the results of crosshole sonic logging shall include all costs of coring and backfilling the holes with concrete as required.

h. Units of measure: Linear Feet (LF) and Each (EA).

1.2.14 Exploratory Programs

Unit price items listed in the PRICE SCHEDULE include:

0045 EXPLORATORY DRILLING, SOIL DRILLING WITHOUT SAMPLING

0046 EXPLORATORY DRILLING, SOIL DRILLING WITH SAMPLING

0047 EXPLORATORY DRILLING, ROCK DRILLING, WITH CORING

0048 EXPLORATORY DRILLING, SEALING OF EXPLORATORY HOLES WITH CEMENT GROUT

a. Payment for the above items will be made for costs associated with mobilization and demobilization of all necessary drilling equipment, floating plant, labor equipment and materials, and for performing the drilling and sampling as specified. No separate payment will be made for mobilizing the drilling equipment from water access, which costs are considered incidental. Payment will be made only for the drilling of exploratory holes that are included on the contract drawings, or are directed by the Contracting Officer to be so drilled. Payment will not be made for any hole for which satisfactory records (and samples), as determined by the Contracting Officer, are not furnished.

b. All measurements shall be made in the presence of the Contracting Officer's Authorized Representative (COAR). The Contractor shall preserve all exploratory holes in good condition until final measurements are made and until the records and samples have been examined and accepted.

Soil drilling without sampling will be measured to the nearest linear foot, based on the linear feet of holes that were actually drilled through overburden in accordance with the specifications. Measurements will be made from the "original ground surface" to the point at which sampling of the boring begins. The "original ground surface" shall be interpreted as the river bottom for exploratory borings made in the river.

Soil drilling with sampling will be measured for payment to the nearest linear foot, based on the linear feet of holes that were actually drilled through the overburden in accordance with the specifications. Measurement will be made from the elevation at which drive sampling is started to the elevation at which drive sampling is completed.

Rock drilling with coring will be measured for payment to the nearest linear foot, based on the linear feet of holes that were actually cored through rock in accordance with the specifications. Measurement will be made from the elevation at which rock coring is started to the elevation at which rock coring is completed.

Sealing of exploratory holes will be measured for payment to the nearest linear foot, based on the linear feet of holes that are sealed in accordance with the specifications. Measurement will be made from the elevation of the top of the hole to the elevation at which rock drilling was completed.

c. Unit of measure: Linear Feet (LF).

1.2.15 Non-Cofferbox Sheet Piling, H-Piles and Appurtenant Items

Unit price items listed in the PRICE SCHEDULE include:

0050 FABRICATION AND INSTALLATION COSTS FOR SHEET PILE, NON-COFFERBOXES

0051 FABRICATION AND INSTALLATION COSTS FOR H-PILES, NON-COFFERBOXES

a. Payment for the above items shall constitute full compensation for all labor, equipment, and supplies for completing the items of work as shown and as specified. Materials costs for furnishing these items will be paid for separately. Payments shall include costs for guide templates; removal of obstructions; pile removal and redriving; performing measurements for payment; and all other incidental costs in connection with these aspects of

the work under this contract. Payment for these items shall also include costs for shop and field fabrications; performing measurements for payment; testing of materials and products incorporated into the work; all advanced planning and engineering; and all other incidental costs in connection with these aspects of the work under this contract. The Contractor shall anticipate that 10% of the quantity of piles will hit obstructions, and that this cost shall be included in the cost of piling.

b. The actual quantity of sheet piling, and fabricated piling will be based on information gathered from surveys and field measurements and the results of the exploratory drilling and pile driving tests.

c. Payment for the H-piles at the non-cofferboxes shall also include the fabrication costs of attaching the sheet piling interlocks to the H-piles.

d. Measurements shall be the actual linear feet of piling installed IN THE PERMANENT WORK, within the specified tolerances, and accepted by the Contracting Officer. No separate measurement or payment will be made for pile cutoffs or splices, or extra lengths provided for the convenience of the Contractor. The Contracting Officer shall approve all methods and procedures for quantity surveys.

e. Unit of Measure: Linear Feet (LF).

1.2.16 Excavation Inside Cofferboxes

Unit price item listed in the PRICE SCHEDULE include:

0053 UNDERWATER ALLUVIUM EXCAVATION INSIDE COFFERBOXES

a. Payment for this item shall constitute full compensation for all labor, equipment, material and supply costs excavate the alluvium overburden from inside the cofferboxes, including: excavation and transporting the materials to the disposal site and off-loading the material at the off-loading ramp at the Government furnished disposal site and all other incidental costs in connection with this item of work under this contract. It is noted that the Contractor may have to use a combination of methods to thoroughly remove all materials to the limits shown.

Payment for for hauling and depositing the materials at the designated areas at the disposal site will be paid for separately.

b. Measurement for this item will be based on the excavation limits shown on the drawings. Measurement will be made from the point of pre-excavation (initial dredging), within the specified tolerance of El. 699.0, to the top of rock, and will be verified by soundings or other methods approved by the Contracting Officer. No additional payment will be made for any adjustments to the Contractor's excavation operations to meet the requirements of the drawings and specifications. No payment will be made until the area excavated is accepted by the Contracting Officer.

c. Unit of measure: Cubic Yards (CD).

1.2.17 Corner Protection, Wall Armor and Corner Castings

Unit price items listed in the PRICE SCHEDULE include:

0060 CORNER PROTECTION

0061 WALL ARMOR AND MONOLITH JOINT PROTECTION

0062 CORNER CASTINGS

a. Payment for these items shall constitute full compensation for all costs necessary to complete these items of work, including fabricating, delivering, and installation, complete as shown on the contract drawings, including anchorage, welding, and painting, and all other costs associated with these items.

b. Measurement of corner protection and wall armor and monolith joint protection will be by the linear feet of corner protection, wall armor and monolith joint protection furnished and installed. No separate measurement will be made for anchorages or splices.

c. Measurement of corner castings will be by the number of corner castings actually furnished and installed. No separate measurement will be made for anchorages.

d. Unit of Measure: Linear Feet (LF) and Each (EA).

1.2.18 Grating, Planking and Cover Plates

Unit price items listed in the PRICE SCHEDULE include:

0064 GRATING

0065 ALUMINUM PLANKING

0066 EQUIPMENT ACCESS AND EMPTYING VALVE ACCESS COVERS

0067 GATE ANCHORAGE RECESS COVER

0068 ALUMINUM RABBET ANGLES

Payment for these items shall constitute full compensation for all costs necessary to complete these items of work as shown and as specified, including furnishing and installing the items , and all support beams, hardware, rubber, and anchorages.

b. Measurement of the rabbet angles will be by the linear foot installed. Measurement of all other items will be by the square foot installed and accepted.

c. Unit of measure: Square Feet (SF) and Linear Feet (LF).

1.2.19 Check Posts and Line Hooks

Unit price items listed in the PRICE SCHEDULE include:

0069 CHECK POSTS

0070 LINE HOOKS AND GUARDS

a. Payment for these items shall constitute full compensation for all costs necessary to complete these items of work as shown and as specified.

Payment for installing the Government furnished check post assemblies shall include receiving and delivering the posts from the Government's PEWARS

facility, and installing the check post assemblies; furnishing and installing anchorages; painting; and cement grout fill, complete, as shown on the contract drawings and as specified.

b. Measurement of these items will be by the number of each type installed and accepted.

c. Unit of Measure: Each (EA).

1.2.20 Rock Construction Entrances

Unit price items listed in the PRICE SCHEDULE include:

0074 ROCK CONSTRUCTION ENTRANCE, GOVERNMENT FURNISHED DISPOSAL SITE

0096 ROCK CONSTRUCTION ENTRANCE, LEFT BANK BATCH PLANT AREA

a. Payment for rock construction entrances shall constitute full compensation for all costs necessary to complete these items of work as shown and as specified, including construction and maintenance of the rock construction entrances.

b. Measurement for rock construction entrances shall be the number of them installed.

Unit of measure: Each (EA).

1.2.21 Silt Fences and Fabric Fences

Unit price items listed in the PRICE SCHEDULE include:

0077 SILT FENCE, GOVERNMENT FURNISHED DISPOSAL SITE

0078 SUPER SILT FENCE, GOVERNMENT FURNISHED DISPOSAL SITE

0093 FILTER FABRIC FENCE, 18-INCH HIGH, LEFT BANK BATCH PLANT AREA

0094 FILTER FABRIC FENCE, 30-INCH HIGH, LEFT BANK BATCH PLANT AREA

0095 SUPER SILT FENCE, LEFT BANK BATCH PLANT AREA

a. Payment for these items shall constitute full compensation for providing all plant, labor, material, and equipment and performing all operations necessary to perform this work as shown and as specified, including the inspection and maintenance of these items. Payment for super silt fence shall also include all costs in connection with furnishing the chainlink fabric and posts as shown and as specified.

b. Measurement will be made by the linear foot of material installed and accepted.

c. Unit of Measure: Linear Feet (LF).

1.2.22 Filling, Backfillling, Embankments and Berms

Unit price items listed in the PRICE SCHEDULE include:

0083 CONFINEMENT BERM, GOVERNMENT FURNISHED DISPOSAL SITE

0084 HAUL ROAD EMBANKMENTS, FILL, GOVERNMENT FURNISHED DISPOSAL SITE

0100 GRANULAR FILL MATERIAL, LEFT BANK BATCH PLANT AREA

a. Payment for these items shall constitute full compensation for all costs in connection with completing these items of work including furnishing and placing the specified material, spreading, grading and compaction.

The costs for the confinement berm and embankments at the Government furnished disposal site will include taking the material that has been delivered to the off-loading area and using it in the construction of these features. The costs will not include transport of material to the off-loading ramp, which is paid for under separate items.

b. These items shall be measured by the cubic yard within the limits shown on the drawings, or as otherwise specified. Measurement shall be made by taking cross-sections before and after placement and compaction is performed and calculating the volume by the average-end-area method. Cross sections shall be taken before and after placement at the same stations as the sections shown on the contract drawings or as may be additionally required by the Contracting Officer, and shall be performed in the presence of the Contracting Officer or his Authorized Representative, unless otherwise waived. Volume computations shall be performed by the Contractor, and copies of all cross section data and computations shall be submitted to the Contracting Officer.

c. Unit of Measure: Cubic Yards (CD).

1.2.23 Aggregate Surfaces

Unit price items listed in the PRICE SCHEDULE include:

0085 8-INCH AGGREGATE SURFACING, GOVERNMENT FURNISHED DISPOSAL SITE

0134 GRAVEL ACCESS ROAD, LEFT BANK BATCH PLANT AREA

a. Payment for these items shall constitute full compensation for all labor, equipment, material and supply costs to construct these items as shown and as specified in Sections 02145 CONSTRUCTION OF DISPOSAL SITE and 02720 AGGREGATE SUBBASE AND BASE COURSES. The payment shall constitute full compensation for all labor, equipment, materials and supplies for furnishing and placing crushed aggregate material, including compaction; shall include any required field and laboratory testing; shall include performing measurements for payment and maintenance of the aggregate surfacing; and all other incidental costs in connection with these aspects of the work under this contract.

b. Measurement shall be made on the basis of square yards of material furnished and placed as specified and as shown on the drawings.

c. Unit of measure: Square Yards (SY).

1.2.24 Guiderail

Unit price items listed in the PRICE SCHEDULE include:

0086 GUIDERAIL, GOVERNMENT FURNISHED DISPOSAL SITE

0120 GUIDERAIL, PADOT TYPE 2-SC, LEFT BANK BATCH PLANT AREA

a. Payment for guiderail shall constitute full compensation for all costs necessary to complete this item of work as shown and as specified.

b. Measurement for guiderail shall be the actual actual length of guiderail installed and accepted, including terminal ends.

Measurement for terminal ends shall be the number of terminal ends installed.

Unit of measure: Linear Feet (LF) and Each (EA).

1.2.25 Storm Drainage Pipes

Unit price items listed in the PRICE SCHEDULE include:

0089 15-INCH RCP CULVERT, GOVERNMENT FURNISHED DISPOSAL SITE

0090 18-INCH RCP CULVERT, GOVERNMENT FURNISHED DISPOSAL SITE

0106 24-INCH OUTFALL 001 PIPE & FITTINGS, REINFORCED CONCRETE PIPE AND BACKFILL, LEFT BANK BATCH PLANT AREA

0108 GATE VALVE AND REDUCER COUPLING, LEFT BANK BATCH PLANT AREA

0109 24-INCH, SDR 21 HDPE PIPE FROM VALVE STATION MANHOLE TO INLET NO. 1, LEFT BANK BATCH PLANT AREA

0112 24-INCH PE, SMOOTH INTERIOR, STORM SEWER PIPE FROM INLET NO. 1 THROUGH NO. 4, BETWEEN INLET NO. 2 AND NO. 5 AND BETWEEN MANHOLE NO. 1 AND NO. 2, LEFT BANK BATCH PLANT AREA

a. Payment for these items shall constitute full compensation for furnishing all materials, equipment, plant, and tools; and for labor and other incidentals necessary to complete the work as shown and as specified, including furnishing and placing the item and testing for leaks. Excavation will be paid for separately.

b. Measurement for the gate valve and reducer coupling will be by the number installed. Measurement for all other items listed above will be by the linear foot installed and accepted.

c. Unit of measure: Linear Feet (LF) and Each (EA)

1.2.26 Manholes and Inlets

Unit price items listed in the PRICE SCHEDULE include:

0105 OUTFALL 001, MANHOLE, 48-INCH DIAMETER PRECAST REINFORCED CONCRETE, LEFT BANK BATCH PLANT AREA

0107 VALVE STATION MANHOLE, 60-INCH DIAMETER PRECAST REINFORCED CONCRETE, LEFT BANK BATCH PLANT AREA

0110 INLETS NO. 1, 2 AND 5, LEFT BANK BATCH PLANT AREA

0111 INLETS NOS. 3 AND 4, PADOT TYPE M, LEFT BANK BATCH PLANT AREA

0113 MANHOLES NOS. 1 & 2, 48-INCH DIAMETER PRECAST REINFORCED CONCRETE, LEFT BANK BATCH PLANT AREA

a. Payment for these items shall constitute full compensation for furnishing all materials, equipment, plant, and tools; and for labor and other incidentals necessary to complete the work as shown and as specified, including furnishing and placing the item.

b. Measurement for these items will be by the number of structures installed.

c. Unit of Measure: Each (EA).

1.2.27 Chain Link Fencing

Unit price items listed in the PRICE SCHEDULE include:

0121 CHAIN LINK FENCING, 6-FT HIGH GENERAL SECURITY SYSTEM, LEFT BANK BATCH PLANT AREA

0122 CHAIN LINK FENCING, 8-FT HIGH HIGH SECURITY SYSTEM, LEFT BANK BATCH PLANT AREA

0123 MAIN ACCESS GATE, 31-FT MIN OPENING, 6-FT HIGH, GENERAL SECURITY SYSTEM, LEFT BANK BATCH PLANT AREA

0124 SLIDING ACCESS GATE, 19-FT WIDE, 8-FT HIGH, HIGH SECURITY SYSTEM, LEFT BANK BATCH PLANT AREA

0125 SWINGING ACCESS GATE, 4'-0" WIDE, 6-FT HIGH, GENERAL SECURITY SYSTEM, LEFT BANK BATCH PLANT AREA

0126 SWINGING ACCESS GATE, 4'-0" WIDE, 8-FT HIGH, HIGH SECURITY SYSTEM, LEFT BANK BATCH PLANT AREA

a. Payment for new chain link fence shall constitute full compensation for furnishing all materials, equipment, plant, and tools; and for labor and other incidentals necessary to complete the work as shown and as specified.

b. Measurement for new chain link fence will be by the linear foot of fence installed and accepted

Measurement for gates shall be the number of each type and size gate furnished and installed..

c. Unit of measure: Linear Feet (LF) and Each (EA)

1.2.28 Seeding and Vegetation

Lump Sum price items in the PRICE SCHEDULE include:

0079 GRASS LINED CHANNELS, GOVERNMENT FURNISHED DISPOSAL SITE

0092 TEMPORARY SEEDING, GOVERNMENT FURNISHED DISPOSAL SITE

0116 TOPSOIL, LEFT BANK BATCH PLANT AREA

0117 SEEDING, LEFT BANK BATCH PLANT AREA

Payment for seeding operations shall constitute full compensation for all labor, equipment, material and supply costs to provide a satisfactory stand of turf over the disturbed areas and areas indicated to be seeded, including seeding and mulching and other incidental work.

Payment for the grass lined channels at the Government furnished disposal site will also include excavation of the channels to the lines and grades shown.

Measurement for the grass lined channels at the Government furnished disposal site will be made by the linear feet of channels actually constructed, and approved.

Measurement for all seeding operations will be made by the acre of area that contains a satisfactory stand of vegetation.

Measurement of topsoil will be made by the ton of material delivered and used on site.

b. Units of measure: Linear Feet (LF), Each (EA), Acre (AC), and Ton (TN).

1.2.29 Bituminous Pavement

Unit price items listed in the PRICE SCHEDULE include:

0128 BITUMINOUS CONCRETE BASE COURSE (BCBC) , LEFT BANK BATCH PLANT AREA

0129 BITUMINOUS WEARING COURSE, LEFT BANK BATCH PLANT AREA

0130 BITUMINOUS BINDER COURSE, LEFT BANK BATCH PLANT AREA

0131 TRAPEZOIDAL CHANNEL, PAVED LINING, LEFT BANK BATCH PLANT AREA

0132 ASPHALT DIVERSION BERM, LEFT BANK BATCH PLANT AREA

0133 ASPHALT WEDGE CURB, ID-2 WEARING, LEFT BANK BATCH PLANT AREA

a. Payment for these items bituminous concrete base course, binder course and bituminous wearing course shall constitute full compensation for furnishing all materials, equipment, plant, and tools; and for labor and other incidentals necessary to complete the work required as specified, including joint treatment at the interfaces of new paving with existing paving or structures.

b. Measurement for these items bituminous concrete base, binder and wearing courses will be by the square yard of bituminous pavement material in place.

c. Measurement for curbing and channel will be by the linear feet of material in place.

d. Measurement of asphalt berms will be by the number of such berms constructed.

e. Unit of Measure: Square Yards (SY), Linear Feet (LF) and Each (EA).

1.2.30 Jet Grout Columns

1.2.30.1 Jet Grouting

Unit price item in the PRICE SCHEDULE include:

0149 JET GROUT COLUMNS, COFFERBOX CLOSURES

a. Payment for this item shall constitute full compensation for all labor, equipment, material and supply costs, for drilling through alluvium and one-foot into rock to perform jet grouting; performing the jet grouting; and all other costs not included in other price items, for constructing the jet grout columns as specified in Section 02270 JET GROUTING. These costs will include the cost of all materials for producing the grout including cement, aggregates, and admixtures.

b. Payment for this item shall also include costs for performing measurements for payment; all advanced planning and engineering; and all other incidental costs in connection with these aspects of the work under this contract.

c. The unit of measurement for jet grouting will be based on information gathered from field measurements. Measurements shall be the actual linear feet successfully drilled, grouted and accepted by the Contracting Officer, as measured along the axis of the hole.

d. Unit of measure: Linear Feet (LF).

1.2.30.2 Jet Grout Sampling and Testing

0150 TEST CORE SAMPLES, JET GROUT WALLS

a. Payment for this item shall constitute full compensation for all labor, equipment, material and supply costs to obtain test core samples of the soilcrete as specified in Section 02270 JET GROUTING.

b. Payment for this item shall also include costs for guide templates; drilling to obtain test core samples; in-place permeability testing; strength testing; backfilling the holes as required; performing measurements for payment; all advanced planning and engineering; and all other incidental costs in connection with these aspects of the work under this contract.

c. The unit of measurement for obtaining test core samples will be based on measurements of the actual test core sample recovered. Measurements shall be the actual linear feet of test core sample recovered.

d. Unit of measure: Linear Feet (LF).

1.2.31 Materials Costs for Selected Steel Items

0151 STEEL MATERIALS COSTS FOR REINFORCING STEEL AND DOWELS, LOCK WALLS AND APPURTENANCES

0152 STEEL MATERIALS COSTS FOR PERMANENT CASING, 54-INCH DIAMETER FOUNDATION DRILLED SHAFTS (48-INCH ROCK SOCKET)

0153 STEEL MATERIALS COSTS FOR PERMANENT CASING, 78-INCH DIAMETER FOUNDATION DRILLED SHAFTS (72-INCH ROCK SOCKET)

0155 STEEL MATERIALS COSTS FOR REINFORCING STEEL, FOUNDATION DRILLED SHAFTS

0156 STEEL MATERIALS COSTS FOR SHEET PILE, NON-COFFERBOXES

0157 STEEL MATERIALS COSTS FOR H-PILES, NON-COFFERBOXES

0159 STEEL MATERIALS COSTS FOR EMPTYING VALVES AND EMPTYING BULKHEADS

a. Payment for these items shall include ONLY the costs of steel materials used in the manufacture of these items. Payment for fabrication and installation, as well as measurements for payment will be made separately. Measurement and payment for these items will only be made for steel materials incorporated into the permanent work, within the specified tolerances, and no separate measurement or payment will be made for non-steel items, cut-offs, splices, extra materials ordered for the convenience of the Contractor, welds, painting, galvanizing or other coatings, and no separate deduction will be made for holes.

b. Payment for reinforcing steel will not include the amount of steel reinforcing used in precast concrete items. Concrete reinforcing and dowels will be measured for payment by the pound in place. The measured lengths will be converted to weights for the size of bars listed by the use of the nominal weights per lineal foot specified in the respective material specifications. Steel in laps indicated on the drawings or required by the Contracting Officer will be paid for at the contract unit price. No payment will be made for the additional steel in laps which are authorized for the convenience of the Contractor.

c. Measurements for permanent steel casing shall be based on the actual amount of permanent casing in-place from the tip elevation to the final permanent cutoff elevation, converted to pounds. No measurement will be made for casing above the cutoff elevation. No separate payment will be made for cut-off or splicing of permanent steel casings. Lengths of casing shall be ordered based on the results of the exploratory borings (See Section 02012 EXPLORATORY DRILLING).

c. Payment for the H-piles at the non-cofferboxes shall also include the materials costs of attaching the sheet piling interlocks to the H-piles.

d. The actual quantity of sheet piling, H-piles and fabricated piling will be based on information gathered from surveys and field measurements and the results of the exploratory drilling and pile driving tests.

e. Payment for the steel materials costs for the emptying valves and emptying bulkheads shall include only the costs of steel materials included in the fabrication of the valves and bulkheads and appurtenant items including valves, bulkheads, lifting beam, liners, frames, bonnets, and valve shafts, and all other items associated with the valves and bulkheads.

f. Unit of measure: Pounds (LB).

1.2.32 Sediment Removal, Stub Wall Modifications

Unit price items listed in the PRICE SCHEDULE include:

0162AA SEDIMENT REMOVAL, STUB WALL MODIFICATIONS, 0 TO 300 CUBIC YARDS

0162AB SEDIMENT REMOVAL, STUB WALL MODIFICATIONS, 301 TO 500 CUBIC YARDS

0162AC SEDIMENT REMOVAL, STUB WALL MODIFICATIONS, ALL OVER 500 CUBIC YARDS

a. Payment for these items shall constitute full compensation for all labor, equipment, material and supply costs to remove sediment from the stub wall prior to infilling with concrete in accordance with Section 02260 STUB WALL MODIFICATIONS. Payment will be made in accordance with Contract Clause 52.211-5001 VARIATIONS IN ESTIMATED QUANTITIES, SUBDIVIDED ITEMS.

b. Measurement for this item will be based on the the depth No payment will be made until the area excavated is accepted by the Contracting Officer.

All measurement for payment will be based on information gathered from surveys (probings or soundings) of sediment depth prior to removal operations and again following the completion of sediment removal. Initial surveys shall constitute the original cross sections from which all measurements will be based to calculate the quantity of sediment removal accomplished. The second set of surveys shall constitute the final cross-sections from which measurement will be made, and shall be used to verify that the specified tolerance has been met. Unless otherwise specified and/or approved, quantities shall be calculated in cubic yards by the average end area method based on the initial and final surveys.

c. Unit of measure: Cubic Yards (CD).

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

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SECTION 02260

STUB WALL MODIFICATIONS

PART 1 GENERAL

1.1 SUMMARY

This Section covers the requirements for modifying the existing stub wall so that it may be incorporated into the new river wall.

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Infill Of Culvert And Gallery; G RE.

A plan shall be submitted to the Contracting Officer for comment and approval at least 90 days prior to the start of infilling operations in the existing stub wall. The plan shall show and describe the equipment, methods, sequencing and schedule for performing the work as proposed and shall include, but not be limited to, the following:

Plan, detailing methods and procedures of drilling the infill and vent ports, including proposed spacing.

Methods proposed for inspection of the culvert and gallery for sediment, debris and water.

Proposed methods of removal of sediment and debris.

Methods and sequence for placing concrete in the culvert.

Methods and sequence for placing concrete in the gallery.

Method for preparing the infill ports for cast-in-place concrete.

Miscellaneous Work; G RE.

A plan for performing the other miscellaneous modifications to the stub wall shall be submitted with the plan for infilling of culvert and gallery. The plan shall show and describe the equipment, methods and sequencing for performing the remaining modifications to the stub wall without damaging parts of the stub wall that are to remain.

PART 2 PRODUCTS

PART 3 EXECUTION

3.1 INFILL OF CULVERT AND GALLERY

The existing stub wall gallery and culvert shall be filled with concrete prior to construction of the adjoining sections of new river wall. Infill of the culvert shall proceed ahead of infilling of the gallery. Infilling shall be performed in the manner shown on the drawings and shall commence with the installation of infill and vent ports into the culvert and gallery. Ports shall be drilled to the size and locations as shown. Vent holes shall be drilled in the existing culvert ports to vent water from the culvert ports. As infilling progresses, these holes will be allowed to plug with concrete. The Contractor shall inspect the culvert, culvert ports, and gallery to determine the depth of sediment and the presence of any debris. The Contractor shall be responsible for determining the methods to be used to perform the inspection, including cameras, probes and other means necessary to determine the extent of contamination. The Contractor shall also determine extent of water, if any, in the gallery. The Contractor shall remove ~~debris and~~ sediment in the culvert and gallery so that no more than 2 inches of ~~material~~sediment remains. The Contractor shall be responsible for determining the methods to perform this work, including flushing and airlifting and other means necessary and as practical to perform the work. The culvert and gallery shall be inspected for cleanliness immediately prior to placing infill concrete, and a comparison will be made to the depth of sediment determined initially. This comparison will be used as a basis for payment. The culvert shall be filled with concrete using the dry tremie pipe method and gravity feed. The Contractor shall place the concrete in 3 lifts. The first lift shall be a minimum of 5.5 feet. The last lift shall not be less than 4.5 feet to assure adequate clearance for the concrete to flow through the culvert during the final filling. Concrete shall be a minimum of 7 days old before the next lift is placed. The tremie pipes shall be capped and shall be watertight, and shall be checked for any leaks before initiating the delivery of concrete. Concrete shall be placed beginning at the downstream end of the culvert, using multiple tremie pipes to advance the flow of concrete through the culvert. Flow of concrete shall be initiated through the downstream-most pair of infilling ports and the Contractor shall monitor the progress of the concrete at the next pair of infilling ports. When concrete has begun to fill the culvert and the concrete is at an adequate height to provide a seal around the second set of tremie pipes, the flow of concrete shall being through the second pair of ports. This sequence shall be continued, advancing the tremie pipes as the flow progresses. No tremie pipe shall be withdraw from the culvert until the concrete has achieved the required lift height. If a tremie pipe has to be reinserted where concrete has already been placed, the pipe shall be capped, the pipe shall be embedded in the infill, the pipe and hopper shall be charged, and then the flow of concrete shall be initiated. If tremie pipes are to be used more than once during a placement, the pipe shall be recapped and sealed. The pipe shall then be installed in subsequent port, well ahead of the advancing front of concrete. With the last concrete lift, the concrete in the infilling ports shall be overplaced to expel any water, laitance or otherwise washed out concrete, and to assure that a head pressure is maintained while the concrete sets. Following culvert infilling, the gallery shall be filled in 1 lift, using standard flowable concrete, using gravity feed through tremie pipes. The tremie pipes do not have to be capped. Placing through tremie pipes is necessary to allow the concrete to flow up to the gallery roof and not along the roof. Concrete in the gallery shall not be placed until the

last culvert infill lift is a minimum of 7 days old. Any flow of water into the gallery shall be plugged before the concrete placement is initiated. Any standing water in the gallery shall be removed prior to the placement of infill. Concrete shall be placed beginning at the downstream end of the gallery. Multiple tremie pipes shall be used to advance the flow of concrete through the gallery. Flow of concrete shall be initiated through the downstream-most infilling port and the Contractor shall monitor the progression of the concrete at the next infilling port. When concrete has begun to fill the gallery at the next pipe, concrete shall be placed at this pipe while continuing to place through the previous pipes as necessary. This sequence shall be continued, advancing the tremie pipes as the flow progresses. Concrete shall be overplaced into the infilling ports to expel any air, water, laitance or otherwise degraded concrete, and to assure that a head pressure is maintained while the concrete sets. Once the culvert and gallery has been filled and concrete has achieved initial set, infill concrete shall be removed from at least the top 1 foot of the infilling ports. In addition, any laitance or otherwise poor quality concrete in the infilling ports shall be removed. The remaining hole shall be cleaned and prepared for receiving concrete. The hole shall be filled with cast-in-place concrete in accordance with Section 03301 CONCRETE: CAST-IN-PLACE.

3.2 MISCELLANEOUS WORK

Other miscellaneous removals and modifications to the stub wall shall be as indicated on the drawings. Removal of the existing upstream end face protection and support beams and removal of the downstream existing timber end face protection shall be performed without damaging the existing embedded sheet pile interlocks that are to remain.

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SECTION 03015

CONCRETE: FIELD DEMONSTRATIONS

PART 1 GENERAL

1.1 SUMMARY

The purpose of this Section of the Specifications is to require demonstrations of various concrete placements to verify that the work will be performed in an acceptable manner, and will result in an acceptable product. The Contractor shall be fully responsible for planning and performing the work under this contract in accordance with the contract drawings and the specifications. The Contractor shall be fully responsible for determining the methods to perform the work in accordance with the contract documents. The Government reserves the right to verify that the Contractor's proposed methods, equipment and materials will be acceptable. These demonstrations shall include the following:

Demonstration Drilled Shafts: The Contractor shall construct two representative large diameter demonstration drilled shafts. One shaft shall be fully constructed. The other shaft will remain open and will be used to monitor the long term stability of the shaft prior to concrete placement, and will not include concrete placement.

River Wall Tremie Foundation: The Contractor shall demonstrate underwater placement of concrete in the construction of tremie foundation for the non-cofferbox wall sections.

For each demonstration, the Contractor shall prepare a work plan in accordance with paragraph "SUBMITTALS"; perform the required construction; and sample and test the concrete during the demonstration placement, and after the demonstration concrete has cured.

The demonstrations required under this Section of the Specifications will not relieve the Contractor from performing the work required under this contract in an acceptable manner. Any portion of work found not in compliance with the contract documents shall be cause for rejection. The Contractor shall remove the rejected work and a replacement demonstration shall be performed at no additional cost to the Government, if directed to do so by the Contracting Officer. Proposed corrective plans and procedures, for any work not in compliance with the contract documents, shall be submitted to the Contracting Officer, for approval, prior to proceeding with with any concrete placement.

1.1.1 Contractor's Key Personnel

The Contractor shall use key personnel during performance of the demonstration work who will subsequently be employed in the performance of the actual work. The Contractor's CQC Management team shall be present during testing to discuss issues and solutions to problems revealed during subsequent testing.

1.1.2 Construction Methods

The Contractor shall utilize his proposed formwork, reinforcement, concrete placement system, scaffolding, walkways, and other special features and methods which he proposes using for concrete placements. All procedures shall be as proposed for concrete production.

1.1.3 Testing Requirements

Testing of concrete shall be as specified herein and as otherwise required in the actual work as specified in the applicable Sections of the Specifications. Results of all testing shall be furnished to the Contracting Officer as specified herein and as otherwise required by the testing provisions of the applicable Sections of the Specifications. The Government reserves the right to require additional testing of the demonstration placements. The cost of such inspection will be borne by the Government or the Contractor in accordance with the Contract Clause INSPECTION AND ACCEPTANCE.

1.1.4 Contractor's Records

The Contractor shall keep detailed written records, including written notes, photos and videotapes, to document all operations of the construction and testing of the demonstration concrete placements, indicating date, time, water and air ambient conditions and location of the work or test being performed. Photographic records of the demonstration concrete placements shall be considered construction progress photos, and shall be performed in accordance with Section 01380 PROGRESS PHOTOGRAPHS.

Written documentation of work shall include date and the elements of formwork and embedments, reinforcing, and concrete placement completed as of that date. Written documentation of testing performed shall be as specified herein and as specified in the testing provisions of the applicable Sections of the Specifications. Daily progress reports shall include date, weather conditions, names and positions of each crew member, equipment used, work or tests performed, problems encountered and solutions arrived at. Reports shall be prepared and submitted to the Contracting Officer on a daily basis in accordance with Section 01451 CONTRACTOR QUALITY CONTROL.

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Work Plans; G ED.

For each demonstration, the Contractor shall develop a work plan that depicts and specifies the construction, foundation preparation, and concrete placement procedures for the demonstration facilities, and defines the methods of sampling and testing concrete and performing other tests as specified. The work plans shall include detailed drawings and general specifications for construction of the demonstration facilities. The work plans shall contain a concrete plan in accordance with Section 03010

CONCRETE: GENERAL REQUIREMENTS, a drilled shaft installation plan in accordance with Section 02466 DRILLED SHAFTS, and the other submittals listed below. The work plans shall indicate the level of Engineering and Construction support to be provided during concrete placement demonstrations and oversight of the construction of the demonstration facilities. The work plans shall be neatly organized and legible. The work plans shall include the definition of parameters to be studied and the purposes of the field demonstration. Calculations shall be checked and initialed, and contain references and assumptions.

In addition to drawings required under submittal paragraph "SD-02 Shop Drawings" below, the work plan shall contain drawings that detail the areas to be used for the demonstrations, configuration and layout of the simulated structures and the concrete placement methods to be used, including tremie pipes and support structures and equipment.

For each demonstration placement, the Contractor shall submit a listing of parameters to be tested, and the Contractor proposed methods of performing the tests, including sampling and testing. Results of all tests shall be submitted in accordance with submittal paragraph "SD-06 Test Reports" below.

Experience Records; G RE.

For each demonstration placement, the Contractor shall submit names, positions, and resumes of all key personnel that will be performing the demonstration work to the Contracting Officer for approval, before beginning work on the demonstrations. Qualifications of Contractor's quality control personnel shall be submitted in accordance with Section 01451 CONTRACTOR QUALITY CONTROL.

Demonstration Drilled Shafts; G RE.

The Contractor shall provide the submittals required by Section 02466 DRILLED SHAFTS, paragraph "SUBMITTALS", subparagraph "SD-01 Preconstruction Submittals". the work plan shall include methods for monitoring and reporting the open shaft.

SD-02 Shop Drawings

Demonstration Drilled Shafts; G ED.

The Contractor shall provide the submittals required by Section 02466 DRILLED SHAFTS, paragraph "SUBMITTALS", subparagraph "SD-02 Shop Drawings".

River Wall Tremie Foundation Demonstration

Drawings and narrative depicting the layout and configuration of the proposed demonstration non-cofferbox wall section, and shall include proposed methods and equipment for tremie concrete placement.

SD-06 Test Reports

Concrete Testing Results.

The results of all concrete tests shall be submitted in accordance with the applicable testing provisions of Division 3 - CONCRETE, of the Specifications.

Demonstration Drilled Shafts.

The Contractor shall provide the submittals required by Section 02466 DRILLED SHAFTS, paragraph "SUBMITTALS", subparagraph "SD-06 Test Reports". The test reports shall indicate the drilled shafts used for the demonstrations, and shall indicate the results of concrete integrity tests performed. The report shall indicate all corrective actions and revisions to methods that occurred during the demonstrations. The report shall be approved by the Contracting Officer before further drilled shaft construction is permitted. Test reports shall include open shaft monitoring data, and vibration monitoring data.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 GENERAL

For each demonstration concrete placement, the Contractor shall:

a. Develop a Work Plan that depicts and specifies the construction procedures for the demonstration facilities, the drilled shaft installation plan and the concrete plan, and shall include all submittals specified herein in paragraph "SUBMITTALS", subparagraphs "SD-01 Preconstruction Submittals" and "SD-02 Shop Drawings". All proposed designs and calculations shall be checked and initialed.

b. Construct required demonstration facilities that represent the feature being demonstrated, including preparation for concrete placement.

c. Provide Engineering and Construction support during concrete placement demonstrations and oversee the construction of the demonstration facilities.

d. Produce concrete at the approved on-site batch plant. Sample and test concrete placed during the field demonstration and provide a report of all test results.

e. Core and test concrete after demonstration concrete has cured and provide a report of all test results.

f. Provide any other test results as specified herein and as otherwise required in the actual work as specified in the applicable Sections of the Specifications.

3.2 QUALITY CONTROL

The Contractor shall implement a process of Quality Control for the test program in accordance with Section 01451 CONTRACTOR QUALITY CONTROL, and perform quality control in accordance with the applicable sections of the Specifications .

3.3 GOVERNMENT FURNISHED INFORMATION

The Government will provide concrete mixture designs. Final mixture designs will be determined by performing trial batching and for verifying the final mixture designs in accordance with paragraph TRIAL BATCHING of Section 03051 CONCRETE: MIXTURE PROPORTIONING, prior to placement of concrete for the demonstration.

3.4 DEMONSTRATION OF DRILLED SHAFT CONSTRUCTION

The Contractor shall demonstrate the proposed procedures and methods contained within the Drilled Shaft Installation Plan and concrete plan, prior to any production drilling. This shall be accomplished by successfully completing one (1) full Type 2B demonstration drilled shaft, per 2B dimensions, complete with all required casing, reinforcement and concrete, and monitoring the condition of the rock socket for one (1) Type 2B drilled shaft, with 78" casing driven to rock and 72" rock socket drilled out and left open. The demonstration drilled shafts shall not be production drilled shafts, and will be paid for separately in accordance with Section 01270 MEASUREMENTS AND PAYMENT. The demonstration drilled shafts shall be located in an area chosen by the Contractor within the allowable work and access areas of the river, and approved by the Contracting Officer.After successful completion of the demonstration drilled shafts, the Contractor may reuse them as dolphins, mooring posts, or other facilities constructed for the convenience of the Contractor, but shall be removed completely at the completion of the contract. The demonstration drilled shafts shall be completed immediately prior to construction production drilled shafts. Once the approved Drilled Shaft Installation Plan and concrete plan are approved by the Contracting Officer, the Contractor shall perform the following activities:

1) Install vibration monitoring devices as required below in paragraph "B. Additional Monitoring of Demonstration Shaft 1".

2) Construct Demonstration Shaft 1: Install the casing for a Type 2B drilled shaft, drill out the shaft and drill the 72" rock socket.

3) Leave Demonstration Shaft 1 open and monitor rock socket diameter twice daily (start and end of shift) to monitor rate of socket deterioration. Demonstration Shaft 1 shall be left open for a minimum of 7 days, although the Contracting Officer reserves the right to require the shaft to remain open longer.

4) Construct Demonstration Shaft 2: Locate the center of Demonstration Shaft 2 12 feet from the center of Demonstration Shaft 1. Install the casing for a Type 2B drilled shaft, drill out the shaft and drill the 72" rock socket.

5) Monitor the rock socket of Demonstration Shaft 1 every 2 hours as the drilling operation is conducted for Demonstration Shaft 2.

6) Set reinforcing cage, CSL tubes, etc. in Demonstration Shaft 2 and place concrete in Demonstration Shaft 2. Monitor the rock socket of Demonstration Shaft 1 during the placement of concrete in Demonstration Shaft 2 and every 2 hours thereafter for the first 6 hours (3 checks) after the concrete operation is completed.

7) Continue to monitor the condition of the rock socket of Demonstration Shaft 1 at least twice per day until all work, including concrete placement, in Demonstration Shaft 2 is complete, and as directed by the Contracting Officer.

8) Continue with CSL testing, coring, etc. of Demonstration Shaft 2. CSL testing shall be conducted at concrete ages of 3 days, 5 days and 7 days.

9) When Demonstration Shaft 1 is release, fill only the rock socket with concrete to fill the hole and pull casing. Let alluvium fall in and fill the hole left by casing.

10) When Demonstration Shaft 2 is released, cut the casing at the top of the alluvium.

The Contractor shall use the same equipment and guides for installation of the demonstration drilled shafts as will be used for the actual work. Demonstration Shaft 2 shall include all rebar, access tubes, and embedded items as required for the production shafts. Successful completion of Demonstration Shaft 2 will be based on the following criteria:

1) Permanent casing is effectively installed with the proposed equipment and procedures to a horizontal and vertical accuracy which meets the allowable tolerances, and advanced sufficiently into the top rock layer so that an effective "seal" is achieved.

2) Alluvium is effectively drilled out of the casing, with the proposed procedures and tool(s).

3) A rock socket is effectively drilled with the proposed procedures and tool(s), and which meets the allowable tolerances.

4) The rock socket is effectively cleaned out, with the proposed method, to a degree of cleanliness that meets the allowable tolerances.

5)Excessive deterioration of the rock socket, in the opinion of the Contracting Officer, has not occurred in the shaft after drilling and prior to placement of concrete.

6) The reinforcing cage, including csl tubes, is fabricated and installed effectively with the proposed procedures and equipment, and meets the allowable tolerances.

7) Tremie concrete is batched, delivered and placed effectively in accordance with the proposed procedures, and Crosshole Sonic Logging and core drilling (CSL) verify that a successful placement has been in accordance with the acceptance criteria specified in Section 03820 CONCRETE: DRILLED SHAFTS.

8) Casing cut-off is effectively made with the proposed procedures and within the allowable tolerances.

9) Tremie concrete meets the fresh and hardened concrete property requirements.

10) All required reports are submitted and are acceptable to the Contracting Officer in terms of format and completeness.

A. Acceptance of Demonstration Shaft 2

Demonstration Shaft 2 must show, to the complete satisfaction of the Contracting Officer, that all of the above steps have been satisfactorily completed and in accordance with these specifications, and that Demonstration Shaft 2 is constructed to the tolerances allowed. If Demonstration Shaft 2 is not installed successfully, the Contractor's methods shall be adjusted accordingly, appropriate revisions shall be made to the Drilled Shaft Installation Plan or concrete plan as appropriate, and

the revised plans shall be submitted to the Contracting Officer for review and comment. The Contracting Officer reserves the right to require another demonstration drilled shaft, at the Contractor's expense. No production drilled shafts shall be installed until the prescribed Demonstration Shaft 2 and any additional demonstration shafts are successfully installed. All revisions to the original Drilled Shaft Installation Plan and concrete plan shall also be completed and approved by the Contracting Officer prior to releasing the production drilled shafts for construction. All production drilled shafts shall be constructed in accordance with the methods and procedures detailed in the final Drilled Shaft Installation Plan, including any approved revisions, following the completion of the demonstration drilled shafts.

B. Additional Monitoring of Demonstration Shaft 1

As noted above, Demonstration Shaft 1 is required to be left open so that the Government may be able to predict at what point in time excessive deterioration is likely to occur in future shafts.

C. Vibration Monitoring

The Contractor shall devise and install a vibration monitoring system to identify the amount of vibration created by the drilled shaft installation. The vibration shall be monitored during the drilling operations for both shafts. The system shall identify the peak particle velocity occurring in the alluvium and in the rock in at least three locations outside the drilling operation. Therefore a minimum of six monitoring devices shall be installed (3 locations for rock and alluvium). The three locations shall be selected to monitor the rate that the vibration dissipates over distance, and shall be placed to maximize the information provided during the drilling of the two shafts.

3.5 RIVER WALL TREMIE FOUNDATION DEMONSTRATION

The Contractor shall simulate the construction of the foundation for a non-cofferbox wall section including cutoff walls. The demonstration river wall foundation shall be located upstream of the dam, within the area of the river from the left bank to the new riverwall up to Sta. 5+76.00A, at a location determined by the Contractor and approved by the Contracting Officer. To provide full representation of the project feature, the demonstration shall be located in the upper pool as close as practical to the river wall, but shall not interfere with existing facilities or intended construction. The area chosen should be representative of the depth to be encountered in the actual construction. Drilled shafts for the river wall foundation may be simulated by the use of pipes or casing driven into the river bottom. The Contractor shall design and construct a box structure to simulate the cutoff wall construction for a non-cofferbox wall section, constructed of z-piling and H-piles. The simulated foundation shall have at least six drilled shafts and a full size (overall height, width and depth) reinforcing cage for a six-shaft non-cofferbox monolith. The Contractor may use actual size reinforcing steel, or, at his option, may use materials to represent the steel bar, such as pvc pipe, wooden dowels or other materials of the same diameter as the reinforcing steel. The simulated reinforcing cage shall be adequately fixed and rigid, and the individual elements secured to prevent displacement during concrete placement. General configuration, sizes and arrangement of the drilled shafts, length of sheets, and reinforcing cage shall be as required for the actual construction. The Contractor shall demonstrate methods of removal of alluvial material from the sheets and H-piles, connections, simulated

drilled shafts and other areas as required in the actual construction, including placement of geomembrane. With the Contractor's proposed concrete forming system in place, the Contractor shall demonstrate the placement of the tremie foundation for a non-cofferbox wall section by placing a full height lift of tremie concrete. The Contractor will not be required to remove the demonstration river wall foundation.

3.6 UNDERWATER PLACEMENT OF CONCRETE

The primary intent of the field demonstrations of the underwater concrete placement for the River Wall Tremie Foundations and drilled shafts are to study the capability of the proposed concrete mixtures and the proposed methods to perform as designed. The intended concrete placement characteristics to be demonstrated are as follows:

A. River Wall Tremie Foundations

Underwater concrete placed within the non-cofferbox walls. This concrete must flow freely a minimum distance of 20 feet. The materials must be capable of flowing around the drilled shafts, reinforcement cages, fill spaces within the z-pile sections, and around other miscellaneous items and protrusions. The concrete will be placed by gravity feed tremie pipes. Pumping will not be permitted. Also to be demonstrated shall be Contractor's proposed methods of alluvium removal from the simulated drilled shafts and cutoff walls, as well as installation of the geomembrane covering the alluvium.

B. Drilled Shaft Demonstrations

The placement of drilled shaft concrete, demonstrating that the concrete can be place with minimal washout, and that the concrete can be placed without voids or defects.

3.6.1 Physical Concrete Characteristics

Another intent of the field demonstrations is to study the physical characteristics of the proposed concrete mixtures, including strength, uniformity, washout loss and bleed control of the concrete mixes.

The strengths, washout loss and laitance of the demonstration concrete will be evaluated by sampling and testing the concretes that are placed. In-place concrete strengths will be evaluated from cores extracted from the hardened concrete. The Contractor shall develop a sampling and testing strategy for each demonstration as specified above in paragraph "SUBMITTALS", paragraph "Work Plans".

The configuration of the demonstration facilities must permit visual inspection and evaluation of the concrete and the interfaces between the concrete and the various features in the demonstration facilities.

3.6.2 Demonstration Facilities

3.6.2.1 General

The demonstration facilities shall be designed and constructed to measure and evaluate the properties of the demonstration concretes as described herein. Configuration of the demonstration facilities shall be determined by the Contractor. The locations of the demonstrations shall be outside

the navigation channel and lock approaches, and shall be coordinated with and approved by the Contracting Officer. The demonstrations shall not cause any interference to river navigation. The Contractor shall develop procedures for execution of the concrete demonstrations. The procedures shall be coordinated with the Contracting Officer and shall be made part of the Work Plan for that demonstration placement. The contractor shall provide all necessary Engineering and Construction support for conduct of the concrete demonstrations. All underwater concrete placement demonstrations shall be performed at representative depths underwater and shall be performed with equipment and personnel, including divers, as will be used in the actual work. The demonstration concrete mixes shall be placed through the tremie pipes

3.6.2.2 Production of Demonstration Concrete

The Government will provide the mixture proportions for all demonstration concrete. The Contractor shall provide all the necessary materials and produce the demonstration concrete and shall batch the concrete in the left bank batch plant. The Government shall make any adjustments to the concrete mixtures subsequent to the results of trial batching tests. The Contractor shall transport all demonstration concrete to the demonstration facility and shall place all demonstration concrete in accordance with the applicable specification sections. The contractor shall sample and test all fresh concrete. Laboratory tests for fresh demonstration concrete shall include slump, slump flow, slump and slump flow changes with time, air content, unit weight measurements, bleed tests, washout testing, time of set, and preparation of concrete cylinders for strength evaluation at 7, 28 and 90 days. Testing shall be in accordance with Section 03051 CONCRETE: MIXTURE PROPORTIONING.

3.7 Execution of Field Demonstrations

The concrete placement demonstrations shall be supervised by the Contractor's Concrete Superintendent and witnessed by the Contracting Officer. Concrete shall be sampled and tested at the batch plant and at the point of placement. The Contractor shall provide adequate concrete technicians to perform all field tests on fresh concrete. The concrete technicians shall record all test data at the bath plant and at the demonstration site and provide a copy of the report to the Contracting Officer. The Contractor shall use the on site laboratory for concrete tests. The Contractor shall provide all other necessary Engineering and Construction support for conduct of the concrete demonstrations. The demonstration concrete shall be placed in accordance with the procedures contained within the approved Work Plan.

3.8 CONCRETE SAMPLING AND TESTING

3.8.1 General

The Contractor shall develop procedures for sampling, inspection and testing of the concrete mixtures placed during the demonstrations. The procedures shall be coordinated with the Contracting Officer, and shall conform to the requirements contained in the applicable concrete Sections of the Specifications for the actual work and as required herein. Testing shall include that conducted during batching of the demonstration concrete and specimens prepared in the field. The test data shall be compiled and a copy of the report provided to the Contracting Officer. CSL testing shall be conducted for the demonstration shaft in accordance with Section 02466 DRILLED SHAFTS, except that CSL testing shall be conducted at concrete ages

of 3 days, 5 days, and 7 days.

3.8.2 Core Samples

The quality of the in-place concrete shall be visually inspected by means of core extraction. Cores shall be extracted in accordance with the following subparagraphs. Coring shall not be performed until the concrete is a minimum of 21 days old, and the concrete shall have gained adequate strength to allow the cores to be extracted without damage. The Government reserves the right to order additional coring and coring of larger or smaller diameter. Additional coring required to investigate defects resulting from the Contractor's methods and procedures shall be at no cost to the Government. All cores extracted are the property of the Government. The cores shall be logged and placed in core boxes, and shall be turned over to the Government.

3.8.2.1 Demonstration Drilled Shaft

The demonstration drilled shaft shall be inspected by extracting six cores. The location of the cores shall be one in the center of the shaft and three cores located 120 degree apart, inside the reinforcement cage, as close to the reinforcement as practical. These four cores shall have a minimum nominal diameter of 2.5 inches. The cores shall be extended into rock and shall recover a minimum of 3 feet of rock to allow for inspection of the concrete/rock interface. The remaining two cores shall be extracted from the area located between the casing and the reinforcement cage. For these two cores, the core diameter shall be an adequate size to retrieve representative samples of concrete, but shall not be greater than 2 inches. The cores shall be located 180 degrees apart and shall be taken to the tip of the casing. Drilling may be terminated if steel is encountered and prevents advancement of the drill bit.

3.8.2.2 River Wall Tremie Foundation Demonstration

The river wall tremie foundation demonstration shall be inspected by extracting a minimum of 20 cores. The location of the cores shall be as designated by the Contracting Officer, however shall target, but will not be limited to, such areas as: 1)the farthest distance from a tremie pipe, 2)the corners of the placement, 3)areas around the shafts, 4)areas at heavy reinforcement, and 5)areas within the z-pile sections. The cores shall be extended to the depth of the alluvium. Of these 20 cores, sixteen shall have a nominal diameter of 2.5 inches or larger. The remaining four cores shall have a minimum diameter of 4 inches. These four cores will be used to evaluate in-place concrete strength as well as for visual inspection. The Government will be responsible for preparing and testing specimens from the cores, however the contractor shall provide the necessary labor to assist the Government Materials Technician.

-- End of Section --

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SECTION 03050

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SECTION 03050

CONCRETE: MATERIALS

PART 1 GENERAL

1.1 SUMMARY

This section addresses the requirements for materials to be used for concrete production.

1.2 RELATED WORK SPECIFIED ELSEWHERE

Section 03051 CONCRETE: MIXTURE PROPORTIONING

Section 03052 CONCRETE: PRODUCTION AND TRANSPORT

1.3 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO M 182	(1991; R 2000) Burlap Cloth made from Jute or Kenaf

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C 109/C 109M	(2002) Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or 50-mm Cube Specimens)
ASTM C 1107	(2002) Packaged Dry, Hydraulic-Cement Grout(Nonshrink)
ASTM C 117	(2003) Materials Finer than 75-Micrometer (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C 123	(2003) Lightweight Pieces in Aggregate]
ASTM C 1240	(2003) Use of Silica Fume as a Mineral Admixture in Hydraulic-Cement Concrete, Mortar, and Grout
ASTM C 1260	(1994) Potential Alkali Reactivity of Aggregates (Mortar-Bar Method)
ASTM C 127	(2001) Specific Gravity and Absorption of Coarse Aggregate
ASTM C 128	(2001) Specific Gravity and Absorption of

	Fine Aggregate
ASTM C 131	(2003) Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine]
ASTM C 136	(2001) Sieve Analysis of Fine and Coarse Aggregates
ASTM C 142	(1997) Clay Lumps and Friable Particles in Aggregates
ASTM C 150	(2002a) Portland Cement
ASTM C 171	(2003) Sheet Materials for Curing Concrete
ASTM C 172	(1999) Sampling Freshly Mixed Concrete
ASTM C 204	(2000) Fineness of Portland Cement by Air Permeability Apparatus
ASTM C 260	(2001) Air-Entraining Admixtures for Concrete
ASTM C 295	(2003) Petrographic Examination of Aggregates for Concrete]
ASTM C 309	(2003) Liquid Membrane-Forming Compounds for Curing Concrete
ASTM C 40	(2004) Organic Impurities in Fine Aggregates for Concrete]
ASTM C 451	(1999) Standard Test Method for Early Stiffening of Hydraulic Cement (Paste Method)
ASTM C 494	(1999a) Chemical Admixtures for Concrete
ASTM C 518	(2002) Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
ASTM C 535	(2003) Resistance to Degradation of Large-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine]
ASTM C 566	(1997) Total Moisture Content of Aggregate by Drying
ASTM C 618	(2003) Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete
ASTM C 87	(2003) Effect of Organic Impurities in Fine Aggregate on Strength of Mortar]
ASTM C 881	(2002) Epoxy-Resin-Base Bonding Systems

	for Concrete
ASTM C 989	(2004) Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars
ASTM D 242	(2001) Mineral Filler for Bituminous Paving Mixtures
ASTM D 4791	(1999) Flat Particles, Elongated Particles, or Flat nd Elongated Particles in Coarse Aggregate
ASTM D 75	(2003) Sampling Aggregates

U.S. ARMY CORPS OF ENGINEERS (USACE)

COE CRD-C 114	(1997) Test Method for Soundness of Aggregates by Freezing and Thawing of Concrete Specimens
COE CRD-C 400	(1963) Requirements for Water for Use in Mixing or Curing Concrete
COE CRD-C 61	(1989a) Determining the Resistance of Freshly Mixed Concrete to Washing Out in Water
ER 1110-1-2002	(1993) Cement, Slag and Pozzolan Acceptance Testing
ER 1110-1-261	(1999) Quality Assurance of Laboratory Testing Procedures

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-06 Test Reports

Water Quality Tests.

The required water quality tests shall be submitted to the Contracting Officer.

Aggregate Quality.

The required aggregate quality tests shall be submitted to the Contracting Officer.

Testing and Inspection for Contractor Quality Control.

All required Quality Control inspection and test forms shall be submitted to the Contracting Officer.

SD-07 Certificates

Cement.
Pozzolan.
Silica Fume.
Ground Granulated Blast Furnace Slag.
Epoxy Grout.

Certifications for these materials shall be submitted with each lot delivered. In addition, certifications establishing a quality history of the material shall be submitted in accordance with ER 1110-1-2002 as part of the approval process of the material.

Cementitious Grout.

Descriptive literature of the grout proposed for use containing certified laboratory test results showing that it meets the specified requirements shall be submitted 60 days prior to its use together with a certificate from the manufacturer stating that the grout is suitable for the application or exposure for which it is being considered. In addition, a detailed plan shall be submitted for review, showing equipment and procedures for use in mixing and placing the grout.

Curing Materials.

Certifications for these materials shall be submitted 30 days prior to there use.

PART 2 PRODUCTS

2.1 GENERAL

All materials shall be subject to approval by the Contracting Officer based on the requirements for the individual concrete materials. In addition, all concrete materials shall be compatible with each other at all times. Compatibility will be investigated by the Government to the extent possible during the material approval and mixture proportioning efforts, however, this does not guarantee that material compatibility problems will not be encountered during production, and does not relieve the Contractor from the responsibility of providing compatible materials through the duration of the project. Compatibility of cementitious materials and admixtures will be tested in accordance with ASTM C 451 for early stiffening. Aggregate reactivity will be tested in accordance with ASTM C 1260. Additional compatibility testing will be performed as considered to be appropriate for the materials selected by the Contractor. Once materials have been selected and approved, the type, source and supplier shall not be changed without resubmitting for approval. If the Contractor proposes to change any materials, the cost of testing, the material shall be at the Contractor's expense.

2.2 CEMENTITIOUS MATERIALS

Cementitious materials shall be portland cement in combination with pozzolan and/or ground granulated blast furnace slag and/or silica fume and shall conform to appropriate specifications listed below.

2.2.1 Portland Cement

ASTM C 150, Type II, low alkali under Table 2, Optional Chemical Requirements and false set requirements in Table 4, Optional Physical

Requirements of ASTM C 150 (Type II, FS). In addition to the requirements of ASTM C 150, and for the purpose of concrete produced on site (excluding precast and ready mix concrete), the cement shall be restricted to cube compressive strengths of less than 3,500 psi at 3 days when tested in accordance with ASTM C 109/C 109M. Cement shall be approved as a qualified source in accordance with ER 1110-1-2002. The Contractor shall submit from the producer the information required under Section A-2C. The source shall maintain qualification for the duration of the cement use.

2.2.2 Pozzolan (Fly Ash)

ASTM C 618, Class F with the optional requirements for multiple factor, drying shrinkage, and uniformity from Table 3 of ASTM C 618. In addition, the calcium oxide (lime) content shall be restricted to a range of 3 to 8 percent. The Contractor should note that the calcium oxide restriction may preclude the use of flyash that is a by-product of the combustion of coal from western states. If pozzolan is used, it shall never be less than 15 percent nor more than 35 percent by weight of the total cementitious material, except where specified. Pozzolan shall be approved as a qualified source in accordance with ER 1110-1-2002. The Contractor shall submit from the producer the information required under Section B-2C. The source shall maintain qualification for the duration of the pozzolan use.

2.2.3 Ground Granulated Blast-Furnace Slag (GGBFS)

ASTM C 989, Grade 80 only, including all tables. GGBFS shall be used in combination with fly ash and cement. The maximum surface area shall be 5,000 cm^2/g when tested in accordance with ASTM C 204. GGBFS shall be approved as a qualified source in accordance with ER 1110-1-2002. The Contractor shall submit from the producer the information required under Section A-2C. The source shall maintain qualification for the duration of the GGBFS use.

2.2.4 Silica Fume

Silica fume shall conform to ASTM C 1240. The specific uniformity requirements shall conform with Table 3, Optional Physical Requirements of ASTM C 1240. Silica fume shall be furnished in densified form.

The Contractor shall provide at his expense the services of a manufacturer's technical representative, experienced in mixture proportioning, placement procedures, and curing of concrete containing silica fume. The manufacturer's representative shall be available for consultation by both the Contractor and the Government during mixture proportioning, planning, and production of silica-fume concrete and shall be on site immediately prior to and during at least the first placement of concrete containing silica fume, and at other times if directed.

2.2.5 Temperature of Cementitious Materials

The temperature of the cementitious materials as delivered to the site shall not exceed 150 degrees F.

2.2.6 Cementitious Material Sources

All sources of cementitious material used on this project shall be qualified in compliance with ER 1110-1-2002 by the Corps of Engineers, Engineer Research and Development Center (ERDC), and the sources shall remain qualified through the duration of concrete production during this

contract. Once a source is approved, the Contractor is not relieved of meeting the required specifications or for all quality control and quality assurance testing throughout the duration of the contract. Cementitious materials shall be delivered and used directly from a mill or producer designated as the approved source. Cementitious materials shall be subject to Government testing and inspection in accordance with paragraph GOVERNMENT QUALITY ASSURANCE, INSPECTION AND TESTING. Sources with potential for meeting project requirements are shown in Table C. No guarantee is given or implied that the listed sources are currently capable of meeting project requirements.

2.3 AGGREGATE

Aggregates shall conform to the following.

2.3.1 Fine Aggregate

Fine aggregate shall consist of natural sand. Fine aggregate shall conform to the quality and gradation requirements listed in paragraphs "Aggregate Quality" and "Aggregate Gradations", respectively.

2.3.2 Coarse Aggregate

Coarse aggregate shall consist of crushed limestone. Coarse aggregate shall conform to the quality and gradation requirements listed in paragraphs "Aggregate Quality " and "Aggregate Gradations", respectively.

2.3.3 Aggregate Quality

Quality criteria shall be determined by the following requirements and aggregate service histories. The frequency of testing shall be in accordance with subparagraph "Quality of Aggregates," of paragraph CONTRACTOR QUALITY CONTROL, TESTING AND INSPECTION. Petrographic examination shall be in accordance with ASTM C 295 and shall be used to determine the presence and quantity of deleterious materials. Aggregates as delivered to the mixer shall comply with the following criteria:

AGGREGATE QUALITY REQUIREMENTS

Property	Limiting Criteria Fine Aggregate	Coarse Aggregate
Bulk Specific Gravity, ASTM C 127, ASTM C 128	2.55 Minimum	2.63 Minimum
Absorption, ASTM C 127, ASTM C 128	2% Maximum	3% Maximum
Durability Factor, COE CRD-C 114 ,	80 Minimum	80 Minimum
Clay Lumps and Friable Particles, ASTM C 142	1.2% Maximum	2.0% Maximum
Material Finer Than 75 microns (#200), ASTM C 117	3% Maximum	1% Maximum
Organic Impurities, ASTM C 40, or ASTM C 87	3 Maximum or 95%Minimum	--- NA ---
L.A. Abrasion, ASTM C 131,ASTM C 535	--- NA ---	40% Maximum

AGGREGATE QUALITY REQUIREMENTS

Property	Limiting Criteria Fine Aggregate	Coarse Aggregate
Chert (Less than 2.40 sp gr SSD), ASTM C 123	10% Maximum	5% Maximum
Coal and Lignite (Less than 2.00 sp gr), ASTM C 123	1.0% Maximum	0.5% Maximum
Flat and Elongated Pieces (Note 1)	--- NA ---	12% Maximum

NOTE 1 - The quantity of flat and elongated particles in the coarse aggregate shall be determined in accordance with ASTM D 4791, using a value of 3 for width-thickness ratio and the length-width ratio.

2.3.4 Aggregate Gradation

2.3.4.1 Fine Aggregate

The grading of the fine aggregate as delivered to the mixers shall be such that the individual percent retained on any sieve shall not vary more than 3 percent from the percent retained on that sieve in a fixed grading selected by the Contractor with the approval of the Contracting Officer. The fixed grading may be selected at the start of concrete placement and based upon 30 days fine aggregate production or selected after the first 30 days of concrete placement. The minimum individual percent retained on the No. 8 (2.36 mm) sieve shall be 5 percent and on all smaller sieves, except the No. 200(75 µm), shall be 10 percent. The percent retained on the No. 200 sieve shall not exceed 3%. In addition to the grading limits, the fine aggregate, as delivered to the mixer, shall have a fineness modulus of not less than 2.3 nor more than 3.1. The grading of the fine aggregate shall also be controlled so that the fineness moduli groups (average of the current test and the previous two tests) of the fine aggregate as delivered to the mixer shall not vary more than 0.10 from the target fineness modulus of the fixed grading selected by the Contractor and approved by the Contracting Officer. The range of each group shall not exceed 0.20. The fineness modulus shall be determined in accordance with ASTM C 136. The selected fixed grading shall be within the following limits, except any individual test result may be outside these limits if within the allowable 3 percent variation from the selected grading.

U.S. STANDARD SIEVE DESIGNATION	PERMISSIBLE LIMITS PERCENT BY WEIGHT, PASSING
3/8-in. (9.5-mm)	100
No. 4 (4.75-mm)	95 - 100
No. 8 (2.36-mm)	80 - 95
No. 16 (1.18-mm)	60 - 80
No. 30 (600-µm)	35 - 60
No. 50 (300-µm)	15 - 30
No. 100 (150-µm)	5 - 10
No. 200 (75-µm)	0 - 3

2.3.4.2 Coarse Aggregate

The coarse aggregate shall be washed and rescreened just prior to delivery

to the concrete batch plant bins. The grading of the coarse aggregate shall be as shown below unless otherwise specified.

PERCENT BY WEIGHT PASSING INDIVIDUAL SIEVES

U.S. STANDARD SIEVE DESIGNATION	4.75 to 19.0 mm (No. 4 to 3/4 inch)	19.0 mm to 37.5 mm (3/4 inch to 1-1/2 inch.)	37.5 mm to 75 mm (1-1/2 inch to 3 inch)
100 mm (4 inch)			100
75 mm (3 inch)			90 - 100
50 mm (2 inch)		100	20 - 55
37.5 mm (1-1/2 inch)		90 - 100	0 - 10
25.0 mm (1 inch)	100	20 - 45	0 - 5
19.0 mm (3/4 inch)	90 - 100	0 - 10	
9.50 mm (3/8 inch)	20 - 55	0 - 5	
4.75 mm (No. 4)	0 - 10		
2.36 mm (No. 8)	0 - 5		

2.3.5 Particle Shape

The shape of fine and coarse aggregates shall be generally spherical or cubical. The quantity of flat and elongated particles in the coarse aggregate, as determined by ASTM D 4791, using a value of 3 for width-thickness ratio and length-width ratio shall not exceed 12 percent in any size coarse aggregate group.

2.3.6 Moisture Content

Fine and coarse aggregate shall be conditioned in accordance with paragraph "Aggregate Conditioning." The fine aggregate shall not be placed in bins at the batch plant until it is in a stable state of moisture content. A stable moisture content shall be reached when the variation in the percent of total moisture tested in accordance with ASTM C 566 and when sampled at the same location will not be more than 0.5 percent during 1 hour of the 2 hours prior to placing the material in the batch plant bins and the variation in moisture content when sampled at the same location shall not be more than 2.0 percent during the last 8 hour period that the aggregate remains in the stockpile. The coarse aggregate shall be delivered to the mixers with the least amount of free moisture and the least variation in free moisture practicable under the job conditions. Under no conditions shall the coarse aggregate be delivered to the mixer "dripping wet".

2.3.7 Commercial Concrete Aggregate Sources

Concrete aggregates may be furnished from any source capable of meeting the quality requirements stated in paragraph AGGREGATE. The aggregate sources listed in TABLES A and B at the end of this section were evaluated in the past and were found at that time capable of meeting the quality requirements when suitably processed. No guarantee is given or implied that any of the following listed sources are currently capable of producing aggregates that meet the required quality stated in paragraph AGGREGATE. Approval of a source shall be considered valid only for the sample tested and shall not be taken as an indication of the quality of all material from a source nor for the amount of processing required.

2.3.7.1 List of Sources

A list of potential sources for fine aggregate are identified in TABLE A at the end of this section. A list of potential sources for coarse aggregate are identified in TABLE B at the end of this section.

2.3.7.2 Selection of Sources

After award of the contract, the Contractor shall designate in writing only one source or combination of sources from which he proposes to furnish aggregates. Regardless of the source selected, samples for Government Quality-Assurance testing shall be provided as required by paragraph "Preconstruction Testing by the Government". If the Contractor proposes to furnish aggregates from a source not listed in TABLE A or TABLE B and the source for coarse or fine aggregate so designated by the Contractor does not meet the quality requirements stated in the paragraph AGGREGATE, the Contractor shall furnish the coarse or fine aggregate, as the case may be, for testing from one or a combination of the sources listed at no additional cost to the Government.

2.4 MINERAL ADMIXTURES

2.4.1 Limestone Powder

Limestone powder shall meet the requirements of ASTM D 242 and shall contain a minimum of 95% calcium carbonate. Dolomite content shall be less than 3 percent. Sources with potential for meeting project requirements are shown in Table D. No guarantee is given or implied that the listed sources are currently capable of meeting project requirements.

2.5 CHEMICAL ADMIXTURES

Chemical admixtures, when required or permitted, shall conform to the appropriate specification listed. Admixtures shall be furnished in liquid form and of suitable concentration and viscosity for easy, accurate control of dispensing, as determined by the Contracting Officer. Admixtures shall be compatible with the other admixtures and with all constituents of the concrete.

2.5.1 Air-Entraining Admixture

The air-entraining admixture shall conform to ASTM C 260 and shall consistently entrain air in the specified ranges under field conditions.

2.5.2 Retarding Admixture

A retarding admixture shall meet the requirements of ASTM C 494, Type B or D, except that the 6-month and 1-year compressive and flexural strength tests are waived. The admixture may be added to the concrete mixture only when approved.

2.5.3 Water-Reducing Admixture

A water-reducing admixture shall meet the requirements of ASTM C 494, Type A or D, except that the 6-month and 1-year compressive strength tests are waived. The admixture may be added to the concrete mixture only when its use is approved or directed and after mixture proportioning studies.

2.5.4 High-Range Water Reducer

High-range water-reducing admixture (HRWRA) shall meet the requirements of ASTM C 494, Type F, except the 6-month and 1-year strength requirements shall be waived. The admixture may be used only after mixture proportioning studies and when approved. The Contractor shall provide the services of a manufacturer's technical representative experienced in mixture proportioning and placement procedures of concrete containing HRWRA. The technical representative shall be available for consultation during mixture proportioning and shall be on-site for the first placement of concrete containing HRWRA.

2.5.5 Anti-Washout Admixture

Anti-washout admixture shall be non-ionic cellulose derivative, capable of preventing excessive washout of concrete, such that the maximum allowable washout is not exceeded when the admixture is used at the recommended dose of the manufacturer.

2.6 CURING MATERIALS

2.6.1 Impervious-Sheet

Impervious-sheet materials shall conform to ASTM C 171, type optional, except, that polyethylene sheet shall not be placed directly on the concrete surface.

2.6.2 Membrane-Forming Curing Compound

Membrane-forming curing compound shall conform to ASTM C 309, Type 1-D or 2. Type 2 shall not be used for surfaces exposed to view. Only a styrene acrylate or chlorinated rubber compound meeting ASTM C 309, Class B, requirements shall be used for surfaces that are to be painted or are to receive bituminous roofing, or waterproofing, or floors that are to receive adhesive applications of resilient flooring. The curing compound selected shall be compatible with any subsequent paint, roofing, waterproofing, or flooring specified. Nonpigmented compound shall contain a fugitive dye, and shall have the reflective requirements in ASTM C 309 waived.

Membrane-forming curing compound will not be allowed to be used on surfaces of the pH treatment structure that are to receive the epoxy protective coating specified in Section 02775 CONCRETE BATCH PLANT TREATMENT STRUCTURE.

2.6.3 Burlap and Matting

Burlap and matting used for curing shall conform to AASHTO M 182.

2.6.4 Cold Weather Blankets

Insulation blankets shall be used in addition to curing materials when required. The blankets shall have a minimum R-value of 4.0 hr-ft^2-$^\circ$F/BTU when tested in accordance with ASTM C 518.

2.6.5 Underwater Insulation

Cold weather protection may be used for underwater placements to facilitate early strength gain at the surface of the concrete. Insulation would allow concrete strength at the surface to develop more efficiently and expedite form removal. Insulation shall have a minimum R-value of 3.0 hr-ft^2-$^\circ$F/BTU

and shall consist of closed-cell insulation or foam, such as insulation board or polyethylene foam sheets. Open-cell insulation and foam will not be permitted. Insulation shall be securely fastened to the forms. The insulation shall be placed on the interior of the forms so that it is protected from water flow and floating debris unless the forms are designed in such a way that exterior insulation can be securely fastened and protected from damage.

2.7 WATER

Water for mixing concrete (batch water) shall be obtained from a water well drilled with in the left bank work area and/or a municipal water supply. Ice used to substitute any portion of the mixing water shall also be well or municipal water. Water for washing and conditioning aggregate and curing concrete, shall be obtained from the Monongahela River, a water well drilled within the left bank work area, and/or a municipal water supply. Any one or combination of these options shall be acceptable as long as the water meets the quality requirements necessary for approval. All water sources shall be tested prior to the start of concrete production, and then annually to maintain material approval, in accordance COE CRD-C 400 and the additional testing required under COE CRD-C 400.

2.7.1 Monongahela River Water

Monongahela River water shall be tested for material approval. In addition to the testing required to obtain and maintain material approval, the river water shall also be tested during periods of low flow and high flow as directed by the Contracting Officer. The following information is provided to alert the contractor to conditions noted in the past at other Monongahela River projects. The information is provided as characteristics noted in the past, and no guarantee is given or implied that these conditions will exist at the site during the life of the project. Past testing of Monongahela River water has shown that the water typically reduces 7-day strengths when tested in accordance with COE CRD-C 400, however the water still meets the requirements of COE CRD-C 400. The river water has been associated with tendencies to accelerate slump loss, but did not preclude the use of Monongahela River water for mixing water. The temperature of the Monongahela River has been recorded to be as high as 95 degrees F during the summer months, and has been cold enough in the winter to produce ice. The severe temperature range of the water will require consideration when sizing concrete heating and cooling systems.

2.7.2 Well Water

The Contractor shall establish a water well for the purpose of supplying mixing water. The well water may be used alone or in combination with municipal water. Well water shall be tested for material approval in accordance CRD C400 and the additional testing required under COE CRD-C 400. In addition, a chemical analysis shall be conducted to assure that there are no contaminants that constitute conditions that pose any health or environmental concerns, or impacts on the concrete quality. Approval shall be at the discretion of Contracting Officer.

2.8 CEMENTITIOUS GROUT

2.8.1 Neat Cement Grout

The grout shall be a cement grout using Type I, Type II or Type III cement in accordance with ASTM C 150. The water-cement ratio shall be

proportioned as required for strength, except that it shall not be higher than 0.45 by weight. Unless otherwise specified on the drawings or elsewhere in the specifications, the grout shall have a minimum compressive strength of 4,000 psi at 4 days when tested in accordance with ASTM C 109/C 109M.

2.8.2 Non-shrink Grout

Nonshrink grout shall conform to ASTM C 1107, Grade B or C, and shall be a commercial formulation suitable for the proposed application, and shall be non-metallic. The minimum compressive strength shall be 5,000 psi at 28 days. This grout shall be used for dowels unless otherwise specified or shown on the drawings.

2.8.3 Base Plate Grout

Base plate grout shall conform to ASTM C 1107, Grade B or C, and shall be a commercial formulation suitable for the proposed application, and shall be non-metallic. The minimum compressive strength shall be 7,000 psi at 28 days.

2.8.4 Underwater Cementitious Grout

Grout used in underwater applications shall be a prepackaged cementitious grout. The grout shall be proportioned, mixed and placed in accordance with the grout manufacturer recommendations. The grout shall contain an expansive agent to assure that the grout forms a long term tight fit, and shall meet the requirements of ASTM C 1107 for Grade B or C. The minimum compressive strength shall be 8,000 psi at 28 days. The washout loss shall be less than 8% when tested in accordance with COE CRD-C 61.

2.8.5 Closure Sock Grout

Grout used to fill closure socks shall be proportioned, mixed and placed in accordance with the sock manufacturer recommendations. Materials shall be those approved for use on the project.

2.8.6 Rock and Soil Anchor Grout

The grout shall be a cement grout using Type I, Type II or Type III cement in accordance with ASTM C 150. The water-cement ratio shall be proportioned as required for strength, except that it shall not be higher than 0.45.

2.9 EPOXY GROUT AND BONDING AGENT

Epoxy resins shall be two component, shall contain 100% solids, and shall be moisture tolerant. The epoxy class shall be as appropriate for the existing ambient and surface temperatures.

2.9.1 Bonding Agent

Epoxy resins for use as a bonding agent shall conform to ASTM C 881, Type V, Grade 1 or 2.

2.9.2 Dowel Grout

Epoxy resins used for dowel grout shall conform to ASTM C 881, Type IV, Grade 3.

2.9.3 Underwater Epoxy Grout

Epoxy grout used underwater shall conform to ASTM C 881, Type IV, Grade 3. The grout shall be formulated and specifically designed for underwater applications.

2.9.4 Injection Grout

Epoxy used as injection grout shall conform to ASTM C 881, Type IV, Grade 1. The grout shall be formulated and specifically designed for injection applications.

2.10 JOINT MATERIALS

Materials for joint fillers, sealers and waterstops shall be in accordance with Section 03150 CONCRETE: EXPANSION JOINTS, CONTRACTION JOINTS, AND WATERSTOPS.

PART 3 EXECUTION

3.1 STORAGE OF MATERIALS

Cement and other cementitious materials shall be stored in weathertight buildings, bins, or silos which will exclude moisture and contaminants and keep each material completely separated. Aggregate stockpiles shall be arranged and used in a manner to avoid segregation and to prevent contamination with other materials or with other sizes of aggregates. Aggregate shall be stored in bins with concrete floors and covered by roof structures. Reinforcing bars and accessories shall be stored above the ground on platforms, skids or other supports. Other materials shall be stored in such a manner as to avoid contamination and deterioration. Admixture vats shall be contained in an enclosure as specified in Section 03052 CONCRETE: PRODUCTION AND TRANSPORT to protect the admixtures from freezing or excessive heat, and shall be designed to contain spills. Admixtures which have been in storage at the project site for longer than 6 months or which have been subjected to freezing shall not be used unless retested and proven to meet the specified requirements. Materials shall be capable of being accurately identified after bundles or containers are opened.

3.2 MATERIAL DELIVERY, STORAGE, AND HANDLING

3.2.1 Cementitious Materials

3.2.1.1 Transportation

When bulk cement, pozzolan, silica fume, or ground granulated blast-furnace slag is not unloaded from primary carriers directly into weather-tight hoppers at the batching plant, transportation from the railhead, mill, or intermediate storage to the batching plant shall be accomplished in adequately designed weather-tight trucks, conveyors, or other means that will protect the material from exposure to moisture.

3.2.1.2 Storage

Cementitious materials shall be furnished in bulk except that cement used for finishing and patching may be packaged. Immediately upon receipt at the site of the work, all cementitious materials, shall be stored in

separate dry, weather-tight, and properly ventilated structures. All storage facilities shall permit easy access for inspection and identification. Sufficient materials shall be in storage to complete any lift of concrete started. In order that cement may not become unduly aged after delivery, the Contractor shall test any cement that has been stored at the site for 60 days or more before using to assure compliance with paragraph "Portland Cement".

3.2.1.3 Separation of Materials

Separate facilities shall be provided for unloading, transporting, and handling each cementitious material. Separate appropriate storage facilities shall be provided for each type of cement and each source of pozzolan or slag. The contents of each storage facility shall be plainly marked with a large permanent sign posted near the loading port.

3.2.2 Aggregate Storage

Fine aggregate and each size of coarse aggregate shall be stored in separate size groups adjacent to the batch plant and in such a manner as to prevent the intermingling of size groups or the inclusion of foreign materials in the concrete. Two bins shall be provided for each type and size of aggregate. Each bin shall have a minimum area of 1,500 square feet. The bins shall have a concrete floor and solid walls a minimum of 10 feet high, and shall be covered by a roof structure. Sufficient fine and coarse aggregate shall be maintained at the site at all times to permit continuous placement and completion of any concrete placement which is started.

3.2.3 Aggregate Conditioning

A sufficient quantity of fine and coarse aggregate shall be at the site at all times to assure a suitable source of conditioned aggregates at all times during which concrete is produced. Conditioning shall involve the treating of aggregate for a minimum of 24 hours prior to use to provide a uniform and consistent moisture content throughout the stockpiled aggregate. Conditioning is required to provide better control over mix water requirements. Conditioning of fine aggregates can be achieved by covering the stockpile with tarpaulins. Conditioning of coarse aggregates shall be achieved by using a two-pile system where conditioned aggregate is used from one pile while the aggregate of the second pile is being conditioned. The Contractor shall provide sufficient lighting of the aggregate stockpiles to facilitate inspection of the aggregate in order to assure that it has been sufficiently conditioned. All fine and coarse aggregate bins shall be covered by a roof structure to protect aggregate from precipitation, wind and exposure to sun.

3.3 CONTRACTOR QUALITY CONTROL, TESTING AND INSPECTION

3.3.1 General

The Contractor shall perform the following inspections and tests described below, and based on the results of these inspections and tests, shall take the action required and shall submit reports as required. When, in the opinion of the Contracting Officer, the concreting operation is out of control, concrete placement shall cease and the operation shall be corrected. The laboratory performing the tests shall be on-site and shall be validated by the Government in accordance with ER 1110-1-261. Validation of the laboratory shall be completed before concrete production begins, and validation shall be completed within 160 days. The Government will inspect

the laboratory, equipment, and test procedures prior to start of concreting operations and at least once per year thereafter for conformance. Materials may be subjected to check testing by the Government from samples obtained at the manufacturer, at transfer points, or at the project site. The individuals who sample and test concrete or the constituents of concrete as required in this specification shall have demonstrated a knowledge and ability to perform the necessary test procedures, and shall be ACI certified as a Concrete Field Testing Technician, Grade I. **A minimum of three technicians shall be provided during concrete production.** Two technicians shall be stationed at the batch plant and one at the point of placement.

3.3.2 Testing and Inspection Requirements

3.3.2.1 Fine Aggregate

a. Grading - At least twice during each shift when the concrete plant is operating, there shall be one sieve analysis and fineness modulus determination in accordance with ASTM C 136. The fineness modulus shall be calculated in accordance with ASTM C 136. The percentage of the material finer than 75 micron (No. 200 sieve) contained in the fine aggregate shall be limited to less than 3.0 percent by weight calculated in accordance with ASTM C 136 using ASTM C 117. In addition, a minimum of 5 percent shall be retained on the No. 8 sieve, and a minimum of 10 percent shall be retained on the No.'s 16, 30, 50 and 100 sieves. The location at which samples are taken shall be at the batching conveyor. However, the Contractor is responsible for delivering fine aggregate to the mixer within specification limits. The results shall be recorded on a sheet on which are also shown the specification limits applicable to the project.

b. Gradation and Fineness Modulus Control Charts - Results for fine aggregate gradation shall be plotted for each sieve size from 3/8-inch to #200. The percent passing shall be plotted on a control chart for each sieve and each test. The upper and lower control limits shall be 3 percent above and 3 percent below the fixed grading, except that the #200 sieve shall never be more than 3 percent total. Results for fineness modulus shall be grouped in sets of three consecutive tests, and the average and range of each group shall be plotted on a control chart. The upper and lower control limits for average shall be drawn 0.10 units above and below the target fineness modulus, and the upper control limit for range shall be 0.20 units above the target fineness modulus. The charts shall be posted on the wall of the testing area. The charts shall be continunous and maintained throughout the contract. The charts shall be plottes on a minimum size sheet of 24-inches x 36-inches.

c. Corrective Action for Fine Aggregate Grading - When the amount passing any sieve is outside the specification limits, the fine aggregate shall be immediately resampled and retested. If there is another failure for any sieve, the fact shall immediately be reported. Whenever a point on the fineness modulus control chart, either for average or range, is beyond one of the control limits, the frequency of testing shall be doubled. If two consecutive points are beyond the control limits, the process shall be considered out of control and concreting shall be stopped. Notify the Contracting Officer, and take immediate steps to rectify the situation. After two consecutive points have fallen within the control limits, testing at the normal frequency may be resumed.

d. Moisture Content Testing - The moisture content shall be continuously monitored during each production shift by a Microwave Meter and twice before the shift in accordance with ASTM C 566. An additional test shall be made whenever the slump is shown to be out of control or excessive variation in workability is reported by the placing foreman. At least two direct measurements of moisture content shall be made per week to check the calibration of the microwave meter. The results of tests for moisture content shall be used to adjust the added water in the control of the batch plant.

e. Moisture Content Corrective Action - Whenever the moisture content of the fine aggregate changes by 0.5 percent or more, the scale settings for the fine-aggregate batcher and water batcher shall be adjusted (directly or by means of a moisture compensation device).

3.3.2.2 Coarse Aggregate

a. Grading - At least once during each shift in which the concrete plant is operating, there shall be a sieve analysis in accordance with ASTM C 136 for each size of coarse aggregate. All aggregate smaller than 1-1/2 inch, regardless of the aggregate size, shall be tested in accordance with ASTM C 136 using ASTM C 117 to determine the amount of material finer than the 75-micron sieve (No. 200). The percentage of material finer than the 75 micron (No. 200) sieve contained within the coarse aggregate shall be limited to less than 1.0 percent by weight of the total coarse aggregate. The location at which samples are taken may be selected by the Contractor as the most advantageous for production control. However, the Contractor shall be responsible for delivering the aggregate to the mixer within specification limits. A test record of samples of aggregate taken at the same locations shall show the results of the current test as well as the average results of the five most recent tests including the current test. The Contractor may adopt limits for control coarser than the specification limits for samples taken other than as delivered to the mixer to allow for degradation during handling.

b. Results for coarse aggregate gradation shall be plotted for each sieve size from 4-inch to #8. The percent passing shall be plotted on a control chart for each sieve and each test. A separate chart shall be provided for each stone size. The upper and lower control limits shall be the limits required by the specified coarse aggregate gradations. The charts shall be posted on the wall of the testing area. The charts shall be continuous and maintained throughout the contract, and shall be plotted on a minimum sized sheet of 24 by 36 inches.

c. Corrective Action for Grading - When the amount passing any sieve is outside the specification limits, the coarse aggregate shall be immediately resampled and retested. If the second sample fails on any sieve, that fact shall be reported. Where two consecutive averages of five tests (or two consecutive tests where large samples are used) are outside specification limits, the operation shall be considered out of control, and that fact shall be reported, concreting shall be stopped, and immediate steps shall be taken to correct the grading.

d. Coarse Aggregate Moisture Content - A test for the moisture content of the coarse aggregate shall be made prior to the start of a concrete production shift and the test shall be performed by the towel dry

method. When two consecutive readings differ by more than 1.0 percent, frequency of testing shall be increased to that specified previously for fine aggregate.

e. Coarse Aggregate Moisture Corrective Action - Whenever the moisture content of any size of coarse aggregate changes by 0.5 percent or more, the scale setting for the coarse aggregate batcher and the water batcher shall be adjusted to compensate for this.

f. Particle Shape Testing - When a problem exists in connection with aggregate particle shape, tests shall be made in accordance with ASTM D 4791. Testing frequency shall be not less than one per day, when directed.

g. Particle Shape Corrective Action - When testing for particle shape is required, two consecutive failures in the same sieve size shall be immediately reported to the Contracting Officer, who shall determine what corrective action is needed.

h. Material Finer than the 75-µm (No. 200) Sieve - When in the opinion of the Contracting Officer, a problem exists in connection with the cleanliness of aggregate, tests shall be made in accordance with ASTM C 117. Testing frequency shall be as directed.

i. Corrective Action for Material Finer than the 75-µm (No. 200) Sieve - When material finer than the 75-µm (No. 200) sieve exceeds 1.0 percent of the weight of the aggregate, the Contracting Officer shall be notified and steps, such as adjustments to washing or other corrective action, shall be initiated immediately.

3.3.2.3 Quality of Aggregates

a. Frequency of Quality Tests - Aggregate samples shall be submitted for approval testing in accordance with paragraph "Preconstruction Testing By The Government." Following approval of the aggregate sources, the Contractor shall retest the aggregates for aggregate quality in accordance with the following frequency schedule. The schedule begins with the approval of the aggregate source. Any test frequency that elapses during the period between when the aggregates are approved and when concrete placement begins shall be retested a minimum of 30 days prior to concrete placement. The results of all testing shall be submitted to the Contracting Officer. Samples tested after the start of concrete placement shall be taken immediately prior to entering the concrete mixer.

PROPERTY	FREQUENCY: FINE AGGREGATE	FREQUENCY: COARSE AGGREGATE	TEST
Specific Gravity	Every 3 months	Every 3 months	ASTM C 127 ASTM C 128
Absorption	Every 3 months	Every 3 months	ASTM C 127 ASTM C 128
Durability Factor Procedure A)	Every 12 months	Every 12 months	COE CRD-C 114
Clay Lumps and Friable			

PROPERTY	FREQUENCY: FINE AGGREGATE	FREQUENCY: COARSE AGGREGATE	TEST
Particles	Every 3 months	Every 3 months	ASTM C 142
Organic Impurities	Every 3 months	Not applicable	ASTM C 40 or ASTM C 87
L.A. Abrasion	Not applicable	Every 6 months	ASTM C 131 ASTM C 535
Petrographic Examination	Every 6 months	Every 6 months	ASTM C 295
Chert, less than 2.40 specific gravity	Every 6 months	Every 6 months	ASTM C 123
Coal and Lignite, less than 2.00 specific gravity	Every 6 months	Every 6 months	ASTM C 123
Particle Shape	Not applicable	Every 3 months	ASTM D 4791

b. Corrective Action for Aggregate Quality - If the result of a quality test fails to meet the requirements for quality during submittal of samples for mixture-proportioning studies or immediately prior to start of concrete placement, production procedures or materials shall be changed and additional tests shall be performed until the material meets the quality requirements prior to proceeding with either mixture-proportioning studies or starting concrete placement. After concrete placement commences, whenever the result of a test for quality fails the requirements, the test shall be rerun immediately. If the second test fails the quality requirement, the fact shall be reported and immediate steps taken to rectify the situation.

3.4 GOVERNMENT QUALITY ASSURANCE, INSPECTION AND TESTING

Day-to day inspection and testing shall be the responsibility of the Contractor Quality Control (CQC) staff. However, representatives of the Contracting Officer can and will inspect construction as considered appropriate and will monitor operations of the Contractor's CQC staff. Government inspection or testing will not relieve the Contractor of any of his CQC responsibilities.

The Government will sample and test aggregates, cementitious materials, other materials, and concrete to determine compliance with the specifications as considered appropriate. The Contractor shall provide facilities and labor as may be necessary for procurement of representative test samples. Samples of aggregates will be obtained at the point of batching in accordance with ASTM D 75. Fresh concrete will be sampled in accordance with ASTM C 172. Other materials will be sampled from storage at the jobsite or from other locations as considered appropriate. Samples may be placed in storage for later testing when appropriate.

3.4.1 Preconstruction Testing By The Government

The following material conformity tests shall be completed by the Government before any trail batching is begun as prescribed in Section 03051 CONCRETE: MIXTURE PROPORTIONING. Note that material quantities stated below are for material approval testing only. additional quantities of materials are required for mixture proportioning studies as stated in Section 03051 CONCRETE: MIXTURE PROPORTIONING.

3.4.1.1 Aggregates

Aggregate samples are required for approval of each aggregate source. In order to perform all necessary testing, including freeze/thaw durability (COE CRD-C 114). For durability testing, a minimum of 1,500 pounds of fine aggregate, 1,500 pounds of 3/4-inch coarse aggregate and 400 pounds of cement are required for each combination of fine and coarse aggregate sources required to achieve the concrete mixture designs described in Section 03051 CONCRETE: MIXTURE PROPORTIONING. If the 1-1/2 or 3-inch aggregate are designated from a different quarry or different ledges of the same quarry as the 3/4-inch aggregate, additional quantities of the aggregate shall be provided to assure adequate quantities for testing. In addition, 500 pounds of each 1-1/2 inch aggregate and 1,000 pounds of each 3-inch aggregate shall be delivered for approval testing. The cement shall be the same cement proposed for use by the Contractor, and shall be from the same lot for aggregate combinations tested. Materials shall be taken under the supervision of the Contracting Officer in accordance with ASTM D 75. The Contractor shall submit a list of proposed sources to the Contracting Officer within 15 days after the notice to proceed, and shall deliver materials within 60 days after notice to proceed to::

U.S. Army Corps of Engineers
Engineer Research and Development Center
3909 Halls Ferry Road
Vicksburg, MS 39180-6199
Attn: CE ERDC-GM-C, Billy Neeley (Bldg 6000)

Sampling and shipment of samples shall be at the Contractor's expense. One hundred and fifty (150) days will be required to complete evaluation of the aggregates. Testing will be performed by the Government in accordance with the applicable COE CRD-C or ASTM test methods. Tests to which aggregate may be subjected are listed in paragraph "Aggregate Quality". The material from the proposed source shall meet the quality requirements of this paragraph to be used for the project. The Government test data and other information on aggregate quality of those sources listed in TABLE A and TABLE B at the end of this section are available for review in the District Office. Quality assurance testing of aggregates by the Government does not relieve the Contractor of quality control requirements.

3.4.1.2 Cementitious Materials, Admixtures, and Curing Materials

Within 15 days after the Notice to Proceed and within 30 days in advance of submitting samples for testing, the Contractor shall submit the source, brand name, and type of all materials other than aggregates that will be required for the manufacture and curing of the concrete. The Contractor shall include supporting documentation to show that the materials comply with the requirements specified. The documentation shall include quality histories for each selected cementitious material source in accordance with ER 1110-1-2002. Sampling and testing as determined to be appropriate will

be performed by and at the expense of the Government. As a minimum, the following quantities are required for approval testing:

MATERIAL	QUANTITY
Cement	10 pounds
Pozzolans	10 pounds
Ground Granulated Blast Furnace Slag (GGBFS)	10 pounds
Silica Fume	10 pounds
Admixtures (each)	1 gallon
Grout Fluidifier	1 pound
Epoxy Resin	1 gallon
Curing Compound	1 gallon

3.4.2 Construction Testing by the Government

3.4.2.1 Testing Aggregates

Testing performed by the Government will not relieve the Contractor of his responsibility for testing as appropriate for quality control. During construction, aggregates will be sampled for acceptance testing as delivered to the mixer to determine compliance with specification provisions. The Contractor shall provide necessary facilities and labor for the ready procurement of representative samples under Contracting Officer supervision. The Government will test such samples at its expense using appropriate COE CRD-C and ASTM methods.

3.4.2.2 Chemical Admixtures

The Contractor shall provide satisfactory facilities for ready procurement of adequate test samples. All sampling and testing of a chemical admixture will be by and at the expense of the Government. Tests will be conducted using samples of materials proposed for the project.

3.4.3 Inspection

Concrete operations may be tested and inspected by the Government as the project progresses. Failure to detect defective work or material will not prevent rejection later when a defect is discovered nor will it obligate the Government for final acceptance.

3.4.3.1 Cementitious Material Sources

If test data prove that a material which has been delivered is unsatisfactory, it shall be promptly removed from the site of the work. Cementitious materials that have not been used within 6 months after being tested shall be retested by the Government at the expense of the Contractor when directed.

3.4.3.2 Cement

Samples of cement for quality-assurance testing will be taken at the project site by the Contracting Officer for testing at the expense of the Government. A copy of the mill tests from the cement manufacturer shall be furnished to the Contracting Officer for each lot.

3.4.3.3 Pozzolan

Samples of pozzolan for check testing will be taken at the project site by the Contracting Officer for testing at the expense of the Government. A copy of the test results from the pozzolan manufacturer shall be furnished to the Contracting Officer for each lot.

3.4.3.4 Ground Granulated Blast-Furnace Slag

Ground granulated blast-furnace slag will be sampled and tested at the project site. A copy of the mill tests from the GGBFS manufacturer shall be furnished to the Contracting Officer for each lot of GGBFS delivered.

3.4.3.5 Silica Fume

Silica fume will be sampled and tested at the project site. A copy of the results from the manufacturer shall be furnished to the Contracting Officer for each lot delivered.

TABLE A

Fine Aggregate Sources

Geologic Formation	Company Name	Quarry Name	Quarry Location	Telephone
Alluvium	Martin Marietta Industries	Dilles Bottom Plant	Dilles Bottom, OH	304-345-6100
	Hanson Aggregates	Davison New Kensington	New Kensington, PA	724-335-7400
	Tri-State River	Georgetown	Georgetown, PA	412-331-1630
	Tri-State River	Dredge 16, Martin Marietta	Ohio River, Pike & New Cumberland Pools	412-331-1630
	Shelly Materials	Ohio River	Racine, OH	724-626-0080

TABLE B

Coarse Aggregate Sources

Geologic Formation	Company Name	Quarry Name	Quarry Location	Telephone
Loyalhanna Limestone				
	Better Materials Corp.	Springfield Pike	Connellsville,PA	724-626-0080
	Hanson Aggregates	Whitney	Whitney, PA	412-362-4900
	Latrobe Constr. Company	Longbridge	Longbridge,PA	724-537-5566
	Coolsprings Stone Supply	Coolsprings	Uniontown,PA	724-437-5200
Vanport Limestone				
	Medusa Aggregate Co.	West Pittsburg	West Pittsburg,PA	412-535-1200
	Quality Aggregates	Boyers	Boyers,PA	412-735-4251

TABLE C

POTENTIAL CEMENTITIOUS MATERIAL SOURCES

Plant	Location	Telephone
Portland Cement ASTM C 150 Type II, LA		
Armstrong	Cabot, PA	724-352-4471
Cemex	Wampam, PA	724-535-4311
Class F Flyash ASTM C 618		
Hatfield	Masontown, PA	412-287-7849
SEFA	Cumberland, TN	314-344-1144
Ground Granulated Blast Furnace Slag ASTM C 989 Grade 80		
Holcim	Weirton, WV	304-797-1411

TABLE D

POTENTIAL LIMESTONE POWDER MATERIAL SOURCES

Plant	Location	Telephone
Mississippi Lime	Alton, IL	800-437-5463
Southdown	Thomasville, PA	610-923-8805

-- End of Section --

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Section 03051: TABLE A - CONCRETE MIXTURE DESIGNATIONS

CONCRETE MIXTURE DESIGNATIONS	
Mix Number	**Designation**
	Tremie
MIX 1	Typical Shaft Tremie Concrete (5000 psi @ 28 days)
MIX 2	Large Shaft ($\phi \geq 84/78"$) and Other Tremie Concrete (4000 psi @ 90 days)
MIX 3	(Not required for this contract)
MIX 4	Underbase Tremie Grout (3000 psi @ 90 days)
	Mass
MIX 5	Interior Mass Concrete (2500 psi @ 90 days)
MIX 6	High Strength Interior Mass Concrete (3000 psi @ 90 days)
MIX 7	Exterior Mass Concrete (3500 psi @ 90 days)
MIX 8	High Strength Exterior Mass Concrete (4000 psi @ 90 days)
MIX 9	(Not required for this contract)
	Structural
MIX 10	(Not required for this contract)
MIX 11	High Strength Structural Concrete (6000 psi @ 28 days)
	Flowable
MIX 12	Standard Flowable Concrete (4000 psi @ 90 days)
MIX 13	High Strength Flowable Concrete (5000 psi @ 90 days)
	Precast
MIX 14	Standard Precast Concrete (5000 psi @ 28 days)
MIX 15	(Not required for this contract)
	Ready-Mix
MIX 16	PADOT Class AA Ready-Mix Concrete (3500 psi @ 28 days)
*** MIX 17**	**Tremie Ready-Mix Concrete (5000 psi @ 28 days)**
MIX 18	PADOT Class AAA Ready-Mix Concrete (4000 psi @ 28 days)

*** Revised by Amendment 0005**

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Section 03051: TABLE B - CONCRETE MIXTURE LOCATIONS

Feature	Sub-Feature	Mix #
Upper River Wall	Shafts	Mix 1
	CSL Tubes	NC Grout
(R-8 to R-10, R-13 to R-18)	Concrete below EL 742	Mix 2
	Concrete above EL 742	Mix 5 / 7
Upper RW Miter Gate	Shafts	Mix 1
(R-11, R-12)	CSL Tubes	NC Grout
	Concrete below EL 705	Mix 2
	Concrete EL 705 to EL 716	Mix 8
	Concrete above EL 716	Mix 6 / 8
	Closure Sock	CS Grout
Stub Wall	Culvert Infill	Mix 2
(R-19 to R-25)	Gallery Infill	Mix 12
Lower River Wall	Shafts	Mix 1
(R-26 to R-28, R-33 to R-35)	CSL Tubes	NC Grout
	Concrete below EL 725	Mix 2
	Concrete above EL 725	Mix 5 / 7
Emptying Valve Monolith	Shafts	Mix 1
(R-29, R-30)	CSL Tubes	NC Grout
	Culverts	Mix 14
	Culvert Secondary Placement	Mix 11
	Steel Liner Infill	Mix 13
	Concrete below EL 696	Mix 2 / 4
	Concrete EL 696 to EL 707	Mix 2
	Concrete above EL 707	Mix 8
	Closure Sock	CS Grout
	Void Filling	IE Grout
Lower RW Miter Gate	Shafts	Mix 1
(R-31 R-32)	CSL Tubes	NC Grout
	Concrete below EL 702	Mix 2
	Concrete EL 702 to EL 712	Mix 8
	Concrete above EL 712	Mix 6 / 8
	Closure Sock	CS Grout
Left Bank Development	Foundations	Mix 16
	Sedimentation Basins	Mix 16
	Access Road	Mix 16
	pH Treament Facility	Mix 16
	Bulkhead Anchor Tieback Wall	Mix 18
*** Diaphragm Cell Stabilization**	**H-pile Tremie Concrete**	**Mix 17**
	Secondary Placement	**Mix 18**
	Anchors	**RS Grout**

CS Grout - Closure Sock Grout or Concrete
IE Grout - Injection Epoxy Grout
NC Grout - Neat Cement Grout
*** RS Grout - Rock and Soil Anchor Grout**

* Revised by Amendment 0005

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Section 03051: TABLE C - CONCRETE MIXTURE PROPERTIES

CONCRETE MIXTURE PROPERTIES									
Concrete Property	**Tremie**				**Mass**				
	Typ. Shaft	Lg. Shaft & Wall	Stilling Basin	Underbase Grout	Interior	High Str. Interior	Exterior	High Str. Exterior	Thrust Block
	MIX 1	**MIX 2**	**MIX 3**	**MIX 4**	**MIX 5**	**MIX 6**	**MIX 7**	**MIX 8**	**MIX 9**
7-Day f'c, psi	---	---	NOT REQUIRED FOR THIS CONTRACT	---	---	---	---	---	NOT REQUIRED FOR THIS CONTRACT
28-Day f'c, psi	5,000	3,000		---	---	---	---	---	
90-Day f'c, psi	---	4,000		3,000	2,500	3,000	3,500	4,000	
w/cm by Vol. Equiv.	0.42	0.42		0.45	0.50	0.50	0.45	0.45	
NMSA, inch	0.75	1.5		sand	3	3	1.5	1.5	
Initial Slump, inch	---	---		---	2 ± 1	2 ± 1	3 ± 1	3 ± 1	
90-Min. Slump, inch	≥ 7.5	≥ 7.5		≥ 7.5	---	---	---	---	
Slump Flow, inch	18 ± 2	18 ± 2		22 ± 4	---	---	---	---	
Air Content, %	---	---		---	4.5 ± 1.5	4.5 ± 1.5	5.5 ± 1.5	5.5 ± 1.5	
Washout, %	≤ 8	≤ 8		≤ 8	---	---	---	---	
Bleed at 8 Hrs., %	≤ 2.0	≤ 2.0		≤ 2.0	---	---	---	---	

Concrete Property	**Structural**		**Flowable**		**Precast**		**Ready-Mix**		
	General Purpose	High Strength	Standard	High Strength	Standard	High Strength	PADOT Class AA	**Tremie ***	PADOT Class AAA
	MIX 10	**MIX 11**	**MIX 12**	**MIX 13**	**MIX 14**	**MIX 15**	**MIX 16**	**MIX 17**	**MIX 18**
7-Day f'c, psi	NOT REQUIRED FOR THIS CONTRACT	---	---	---	---	NOT REQUIRED FOR THIS CONTRACT	---	---	---
28-Day f'c, psi		6,000	---	---	5,000		3,500	**5,000**	4,000
90-Day f'c, psi		---	4,000	5,000	---		---	---	---
w/cm by Vol. Equiv.		0.45	0.42	0.42	0.40		0.47	**0.42**	0.43
NMSA, inch		0.75	1.5	0.75	1 (#57)		1 (#57)	**0.75 (#67)**	1 (#57)
Initial Slump, inch		5 ± 1	---	---	3 ± 1		3 ± 1	---	3 ± 1
90-Min. Slump, inch		---	≥ 7.5	≥ 7.5	---		---	**≥ 7.5**	---
Slump Flow, inch		---	18 ± 2	18 ± 2	---		---	**18 ± 2**	---
Air Content, %		6.0 ± 1.5	5.5 ± 1.5	6.0 ± 1.5	6.0 ± 1.5		6.0 ± 1.5	---	6.0 ± 1.5
Washout, %		---	---	---	---		---	**≤ 8**	---
Bleed at 8 Hrs., %		---	≤ 2.0	≤ 2.0	---		---	---	---

*** Revised by Amendment 0005**

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CONSTRUCTION SEQUENCE

THIS SEQUENCE IS APPLICABLE FOR THE RIVER WALL MONOLITHS R-8 THRU R-10, R-13 THRU R-18, R-26 THRU R-28, AND R-33 THRU R-35

1. IN THE AREA OF THE RIVER WALL THE ALLUVIUM SHALL BE PRE-EXCAVATED DOWN TO ELEVATION 699 FT
2. THE DRILLED SHAFTS SHOULD BE INSTALLED AND THE EXCESS CASING SHOULD BE CUT OFF AND REMOVED
3. THE SEEPAGE CUT OFF ALIGNMENT GUIDE H PILES SHOULD BE INSTALLED
4. THE SEEPAGE CUT OFF SHEET PILING SHOULD BE INSTALLED BETWEEN THE H PILES
5. THE H PILES SHOULD BE CUT OFF AT THE DESIGNATED SHEET PILE ELEVATION AND THE EXCESS REMOVED
6. PLACE GEOTEXTILE MATERIAL ON THE SURFACE OF THE ALLUVIUM.
7. AFTER COMPLETION OF ITEM'S 1 THROUGH 6, THE MONOLITH REINFORCEMENT CAGE SHALL BE LOWERED INTO PLACE SEPARATELY OR DEPENDING UPON THE FORMING METHOD THE CONTRACTOR CHOOSES, IT MAY BE LOWERED WITH THE FORM. TOTAL TONNAGE OF THE FORM AND THE REINFORCEMENT CAGE NEEDS TO BE CONSIDERED FOR THE LIFT. WATER STOPS, MOORING BIT BLOCK OUTS, ETC. SHOULD BE INSTALLED PRIOR TO PLACING THE TREMIE CONCRETE.
8. THE TREMIE CONCRETE SHALL BE PLACED.
9. SEQUENTIAL TREMIE LIFTS SHALL BE MADE IN ACCORDANCE WITH CONTRACT DWGS AND SPECIFICATIONS.
10. AFTER THE TREMIE LIFTS PER ANY GIVEN MONOLITH ARE CONSTRUCTED IN THE WET, THE UPPER LIFTS ARE CONSTRUCTED IN THE DRY, AS INDICATED ON THE RELATED ENGINEERING DRAWINGS. PERTAINING TO THE TOP LIFT, THE RIVER SIDE SHALL BE COMPLETED FIRST AND THE LAND SIDE SHALL BE CONSTRUCTED DURING THE CONSTRUCTION OF THE FACING IN A LATER CONTRACT.

CONCEPTUAL CONSTRUCTION FORM MONOLITHS R-8 THRU R-10, R-13 THRU R-18, R-26 THRU R-28, AND R-33 THRU R-35

THE CONSTRUCTION SLIP/JUMP FORM METHOD SHOWN ON THE 4 SERIES DRAWINGS: 44 AND 45 IS CONCEPTUAL IN NATURE. THIS CONCEPT PROVIDES ONLY ONE OF MANY VIABLE FORMING METHODS FOR CONSTRUCTION OF THE RIVER WALL MONOLITHS THAT THE CONTRACTOR MAY CHOOSE TO USE. THIS CONCEPT IS INFORMATIONAL AND NOT INTENDED TO LIMIT THE CONTRACTOR TO THIS PROPOSED FORM TYPE. IRREGARDLESS OF THE CONSTRUCTION METHOD THE CONTRACTOR CHOOSES TO USE, IT IS THE CONTRACTORS RESPONSIBILITY TO ACHIEVE THE DESIGN REQUIREMENTS SHOWN AND STATED IN THE 20 SERIES ENGINEERING DRAWINGS, SPECIFICATIONS AND OTHER RELATED CONTRACT DOCUMENTATION (037-LCH-20/ 11 THRU 20/22, 20/25AND 20/64).

THE CONCEPT OF CONSTRUCTING THE RIVER WALL WITH A FORMING SYSTEM IS INTENDED TO ELIMINATE THE NEED FOR AN EXTENSIVE SHEET PILE SYSTEM WITH AN ELABORATE SUPPORT STRUCTURE. THE CONSTRUCTION METHOD CHOSEN AND THE FORM DESIGN / FABRICATION IS THE CONTRACTORS RESPONSIBILITY.

THE CONCEPT

INITIALLY THE CONTRACTOR WOULD SET PIPE PILES AT THE JOINTS/CORNERS OF THE MONOLITHS TO SERVE AS GUIDES FOR LOWERING THE FORMS INTO PLACE. THE FORM WILL BE STABILIZED BY INTERNAL FRAMES AND/OR BRACING SYSTEM. THE TREMIE CONCRETE PLACEMENT IN THE FORM WOULD BE DONE IN A MANOR TO INSURE THE LIFT HEIGHT IS RELATIVELY EQUAL THROUGH OUT THE FORM DURING PLACEMENT, THUS PROVIDE EQUAL AN OPPOSITE PRESSURE ON THE FORM TO INSURE THE STABILITY OF THE FORM WORK. THE SEEPAGE CUT OFF SHEET PILING IS RECESSED 6 INCHES INWARD FROM THE MONOLITH EDGES TO ALLOW THE FORMWORK TO SLIP OVER THE SHEETS AND SEAL IN THE ALLUVIUM, FOR THE FIRST TREMIE LIFT. A GROUT SOCK MAY BE NECESSARY TO INSURE THE SEAL.

CONCEPT FORM DESCRIPTION

THE TOP OF THE FORMS WOULD HAVE A BOLT-UP FIXED END FRAME (OR BRACED SYSTEM) TO PROVIDE STABILITY. THE SIDE WALLS ARE HINGED AT THE TOP TO ALLOW THE BOTTOM OF THE WALLS TO SWING OUTWARD TO RELEASE THE FORM FROM THE SET CONCRETE. THE BASE FRAME WOULD HAVE CORNERS THAT OVERLAP AND ARE LOCKED IN PLACE WITH DRIVEN CORNER PINS THAT CAN BE PULLED TO RELEASE AND ALLOW THE BOTTOM OF THE WALLS TO SWING OUTWARD. SACRIFICIAL TIE RODS WOULD BE PLACED WITHIN THE SPAN OF THE BASE FRAME TO MINIMIZE DEFLECTION AND TIGHTEN THE SEAL AGAINST PREVIOUS CONCRETE LIFTS. AN EASY RELEASE LOCKING SYSTEM WOULD BE INCORPORATED ON THE SACRIFICIAL TIE RODS ENDS TO MINIMIZE DIVER REQUIREMENTS. A SWING OUT RELEASE ARMS COULD BE INCORPORATED TO FREE THE FORM FROM THE SET CONCRETE. THE SWING OUT ARM IS PINNED AT THE TOP OF THE FORM AND EXTENDS TO THE BASE . THE BASE END IS ATTACHED BY A SPECIFIED CABLED LENGTH THAT IS ATTACHED TO THE FORM'S BASE FRAME. THIS WOULD ALLOW THE ARM TO SWING OUTWARD TO A DESIRED ANGLE WHEN THE CABLE RUNNING TO THE SURFACE IS TENSIONED. THIS WOULD APPLY A HORIZONTAL FORCE AT THE BASE OF THE FORM THUS STRIPPING THE FORM FROM THE SET CONCRETE. THE TOP FRAME WOULD BE FABRICATE FROM A MEMBER WITH A LARGER DEPTH THAN THE BASE FRAME MEMBER. THIS WOULD ALLOW ROOM FOR THE BASE FRAME TO SWING FREE, BY SEVERAL INCHES, BEFORE STRIKING THE GUIDE PILE.

THE CONCEPT CONSTRUCTION SEQUENCE

THE PROPOSED CONSTRUCTION PROCEDURE IS AS FOLLOWS:

1. IN THE AREA OF THE RIVER WALL THE ALLUVIUM SHALL BE PRE-EXCAVATED DOWN TO ELEVATION 699 FT.
2. THE DRILLED SHAFTS SHOULD BE INSTALLED AND THE EXCESS CASING SHOULD BE CUT OFF AND REMOVED.
3. THE SEEPAGE CUT OFF ALIGNMENT GUIDE H PILES SHOULD BE DRIVEN.
4. THE SEEPAGE CUT OFF SHEET PILING SHOULD BE DRIVEN BETWEEN THE H PILES.
5. THE EXCESS H PILES SHOULD BE CUT OFF AND REMOVED.
6. PIPE GUIDE PILES WOULD BE DRIVEN OR DRILLED AND GROUTED IN PLACE AT THE JOINTS/CORNERS OF THE MONOLITHS TO PROVIDE A GUIDE FOR LOWERING THE FORMS INTO PLACE.
7. AFTER COMPLETION OF ITEM'S 1 THROUGH 6, THE FORM CAN NOW BE LOWERED INTO PLACE, DOWN THE GUIDE PILES. PRIOR TO LOWERING THE FORM, FOR THE MONOLITHS THAT CONTAIN THE FLOATING MOORING BITS, THE AREA WHERE THE FLOATING MOORING BITS ARE LOCATED MUST BE BLOCKED-OUT IN THE TREME. THIS BLOCK OUT MAYBE ATTACHED TO THE FORM BEFORE IT IS LOWERED.
8. PLACE GEOTEXTILE MATERIAL ON THE SURFACE OF THE ALLUVIUM.
9. THE MONOLITH REINFORCEMENT CAGE COULD BE LOWERED INTO PLACE SEPARATELY OR IT COULD BE SUPPORTED ON THE TOP FRAME OF THE FORM AND LOWERED INTO PLACE WITH THE FORM, TOTAL TONNAGE OF THE FORM AND THE REINFORCEMENT CAGE NEEDS TO BE CONSIDERED FOR THE LIFT. WATER STOPS, BLOCK OUTS, ETC. SHOULD BE INSTALLED WITH THE FORM BEFORE LOWERING.
10. THE TREMIE CONCRETE SHALL BE PLACE WITH EVEN DISTRIBUTION AROUND THE PERIMETER OF THE FORM SO AS NOT TO CAUSE INSTABILITY OR EXCESS LATERAL PRESSURE TO ONE SIDE OF THE FORM THAT IS NOT COUNTERED BY PRESSURE IN THE OPPOSITE DIRECTION. AFTER THE CONCRETE IS SET THE NUTS SHOULD BE REMOVED ON THE TIE RODS BY DIVERS (A QUICK RELEASE SYSTEM COULD BE INCORPORATED INSTEAD OF NUTS), THE CORNER PINS PULLED AND THE FORM BASE SPRUNG OUT WITH THE SWING OUT RELEASE ARMS TO STRIP THE FORM.
11. THE FORM SHOULD BE RAISED, FITTED AND PLACED FOR THE NEXT LIFT.
12. THE MONOLITH CONSTRUCTION SEQUENCE COULD BE STAGGER, CONCRETE LIFTS WITH EVERY OTHER MONOLITH FIRST FOLLOWED BY THE INTERMITTENT MONOLITHS (FOR EXAMPLE R-8 AND R-10 FIRST FOLLOWED BY R-9). THE SAME FORM SYSTEM COULD BE USE FOR THE INTERMEDIATES BY REMOVING THE ABUTTING SIDE PANELS FROM THE FORM AND MOVING IN WARD THE BOLT-UP TOP FRAME TO FIT INSIDE THE PREVIOUSLY CONSTRUCTED MONOLITHS. THIS PLACEMENT (R-9) WOULD BE AGAINST THE EXISTING MONOLITH (R-8 & R-10). IT IS NOT NECESSARY TO CONSTRUCT ALL THREE TREMIE LIFTS PER MONOLITH FIRST OR ALL FIRST LIFTS OF ALL MONOLITHS FIRST, THE CONSTRUCTION SEQUENCE COULD BE MIXED. ADDITIONALLY MORE THAN ONE FORM CAN BE CONSTRUCTED AND USED TO MAXIMIZE PRODUCTION.
13. AFTER THE TREMIE LIFTS PER ANY GIVEN MONOLITH ARE CONSTRUCTED IN THE WET, THE UPPER LIFTS ARE CONSTRUCTED IN THE DRY. THE TOP LIFT IS CONSTRUCTED IN THE DRY WITH THE RIVER SIDE COMPLETED FIRST. THE LAND SIDE WILL BE CONSTRUCTED DURING THE CONSTRUCTION OF THE FACING IN A LATER CONTRACT.
14. OTHER POSSIBLE ALTERNATIVES AND VARIATIONS:
    - 14.1 ACCOUNTING FOR THE FORM'S RIGIDITY MAY ALLOW THE FORM FOR THE BOTTOM LIFT TO BE SET IN PLACE FIRST, THUS USE THE FORM AS A TEMPLATE FOR INSTALLING THE GUIDE PILES.
    - 14.2 A MULTI-FORM SYSTEM COULD BE DESIGNED AND USED WITH THE GUIDE SHAFTS ATTACHED TO THE BOTTOM FORM. THE UPPER FORM COULD BE LIFTED UP THE SHAFTS ON SEQUENTIAL LIFTS. THUS ELIMINATING THE NEED TO INSTALL GUIDE PILES AND POSSIBLY PROVIDING BETTER ALIGNMENT.
15. REMOVE ALL FORMS AND GUIDE PILE SYSTEMS AFTER MONOLITHS ARE COMPLETE.

NOTE:
WORK THIS DWG WITH DWGS 4/44 AND 4/45.

US Army Corps of Engineers
Pittsburgh District

Submitted by: /s/JEANINE HOEY P.E. SECTION CHIEF
FB NO.: W911WN
Sheet 1 of 1

Design by: P SURACE P.E.
Dwn by: BEH
Ckd by: JMH
Submission Date: 14 APR 04
Revision Date: X

User: brian.mcfarland
Date: 17-JUN-2004 14:56
Plot Scale: 0.166667'=1.000000
Pen Table:
Color Table

Symbol	Description	Date	Appr.
1	NOTE 15 ADDED - AMEND. NO. 5	17 JUN 04	PAS

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MONONGAHELA RIVER
CHARLEROI LOCKS AND DAM
LOCKS - CONTRACT #1
RIVER WALL
R-8 - 10, R-13 - 18, R-26 - 28, R-33 - 35
CONSTRUCTION SEQUENCE

Drawing Number: 037-LCH-4/43.1

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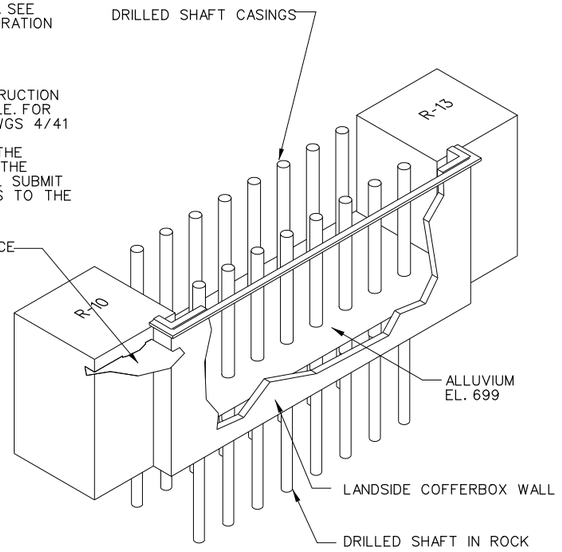
UPPER RIVER WALL MONOLITHS R-11 & R-12 CONSTRUCTION SEQUENCE

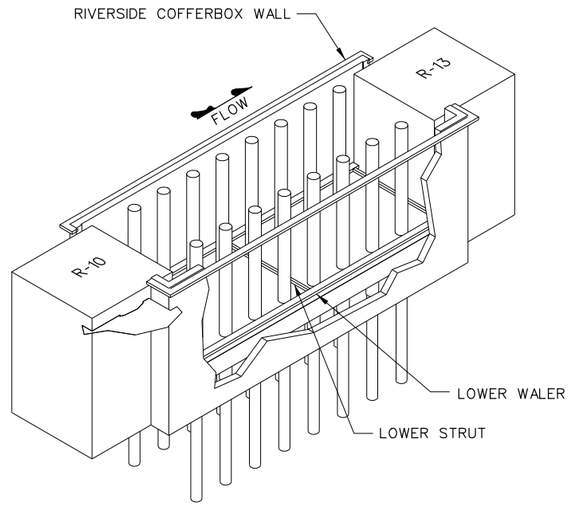
NOTES:

1. AREA DREDGED TO EL 699. SEE DWG 83/4.
2. R-10 AND R-13 PREVIOUSLY CONSTRUCTED
3. ALL WORK TAKES PLACE IN THE UPPER POOL. SEE DRAWINGS AND SPECIFICATIONS FOR STAGE-DURATION TABLE.
4. CONSTRUCTION ACCESS IS FROM RIVERSIDE
5. THIS DRAWING SHOWS AN ANTICIPATED CONSTRUCTION SEQUENCE. SIMULTANEOUS WORK IS PERMISSIBLE. FOR CONSTRUCTION SEQUENCE LIMITATIONS SEE DWGS 4/41 AND 19/17.
   THESE LIMITATIONS SHALL BE OBSERVED BY THE CONTRACTOR WHEN PROPOSING CHANGES TO THE CONSTRUCTION SEQUENCE. CONTRACTOR SHALL SUBMIT PROPOSED CONSTRUCTION SEQUENCE CHANGES TO THE CONTRACTING OFFICER FOR APPROVAL.



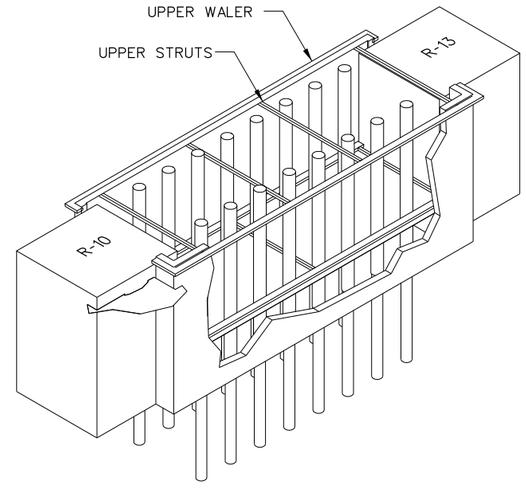
STEP 1:

1. INSTALL LANDSIDE COFFERBOX WALL (SEE DWG. 19/18)
2. INSTALL DRILLED SHAFT CASINGS
3. EXCAVATE, DRILL AND CONCRETE DRILLED SHAFTS



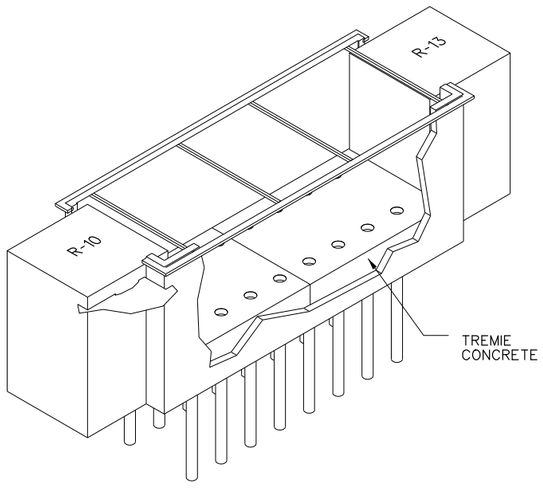
STEP 2:

1. INSTALL RIVERSIDE COFFERBOX WALL
2. INSTALL LOWER WALERS & STRUTS



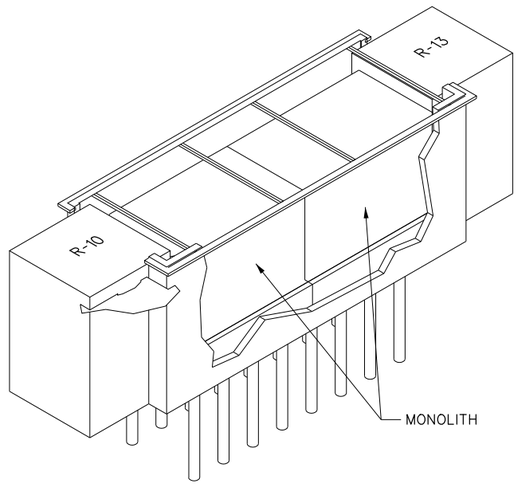
STEP 3:

1. INSTALL UPPER WALERS AND STRUTS
2. EXCAVATE COFFERBOX AREA TO TOP OF ROCK



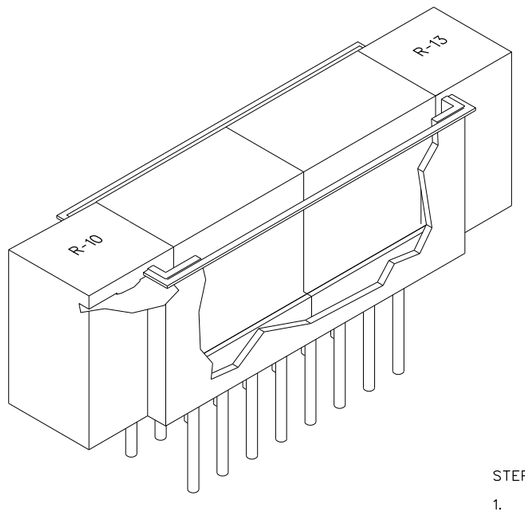
STEP 4:

1. PLACE TREMIE PARTITION BULKHEAD AT MONOLITH JOINT
2. PLACE TREMIE CONCRETE FOR EACH MONOLITH, SEPARATELY
3. LOOSEN COMPRESSION BOLTS (SEE DWG 19/27) AT LOWER WALERS TO UNLOAD LOWER STRUTS
4. DEWATER TO TOP OF TREMIE CONCRETE
5. REMOVE LOWER WALERS, LOWER STRUTS AND SHAFT CASINGS ABOVE TREMIE CONCRETE. (SEE GENERAL NOTE 11, DWG 19/17, FOR REMOVAL)



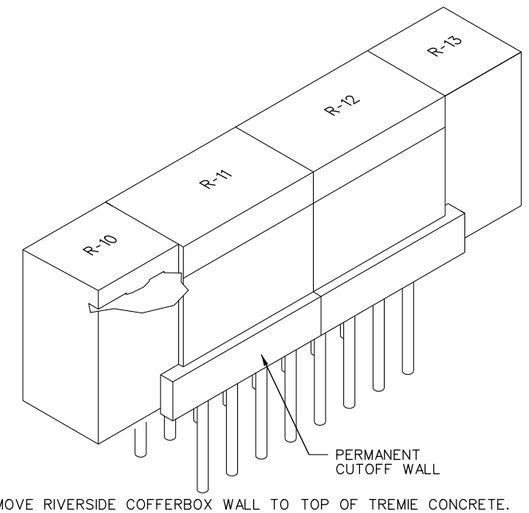
STEP 5:

1. PLACE MONOLITH CONCRETE TO EL 746



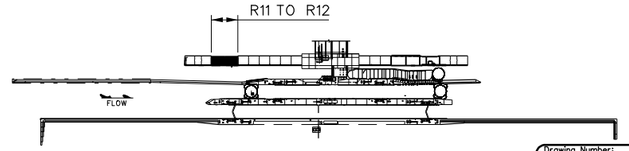
STEP 6:

1. PLACE REPLACEMENT STRUTS BETWEEN CONCRETE MONOLITH AND COFFERBOX WALL (NOT SHOWN). SEE DWG 19/29.
2. REMOVE UPPER STRUTS (A)
3. COMPLETE MONOLITH TO EL 751



STEP 7:

1. REMOVE RIVERSIDE COFFERBOX WALL TO TOP OF TREMIE CONCRETE.
2. REMOVE LANDSIDE COFFERBOX WALL TO TOP OF TREMIE CONCRETE. (REMAINING COFFERBOX WILL FORM PERMANENT CUTOFF WALL).



US Army Corps of Engineers
Pittsburgh District

COMMONWEALTH OF PENNSYLVANIA — JOHN R. PIERCE — REGISTERED PROFESSIONAL ENGINEER — 30767
EXPIRES: 04/29/

Submitted by: LISA PIERCE, P.E.
FB NO.: W911WN

Design by: D. STENSBY, P.E.
Chkd by: LRP
Dwn by: RVR
Submission Date: 2 APR 04
Revision Date: 16 JUN 04

INCA ENGINEERS INC.
User: brian.mcfarland
Date: 17-JUN-2004 15:02
Plot Scale: 0.166667:1.000000
Pen Table:
Color Table

Symbol	Description	Date	Appr.
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MONONGAHELA RIVER
CHARLEROI LOCKS AND DAM
LOCKS - CONTRACT #1
RIVER WALL
MONOLITH R-11 AND R-12 COFFERBOX
CONSTRUCTION SEQUENCE

Drawing Number:
037-LCH-4/46.1

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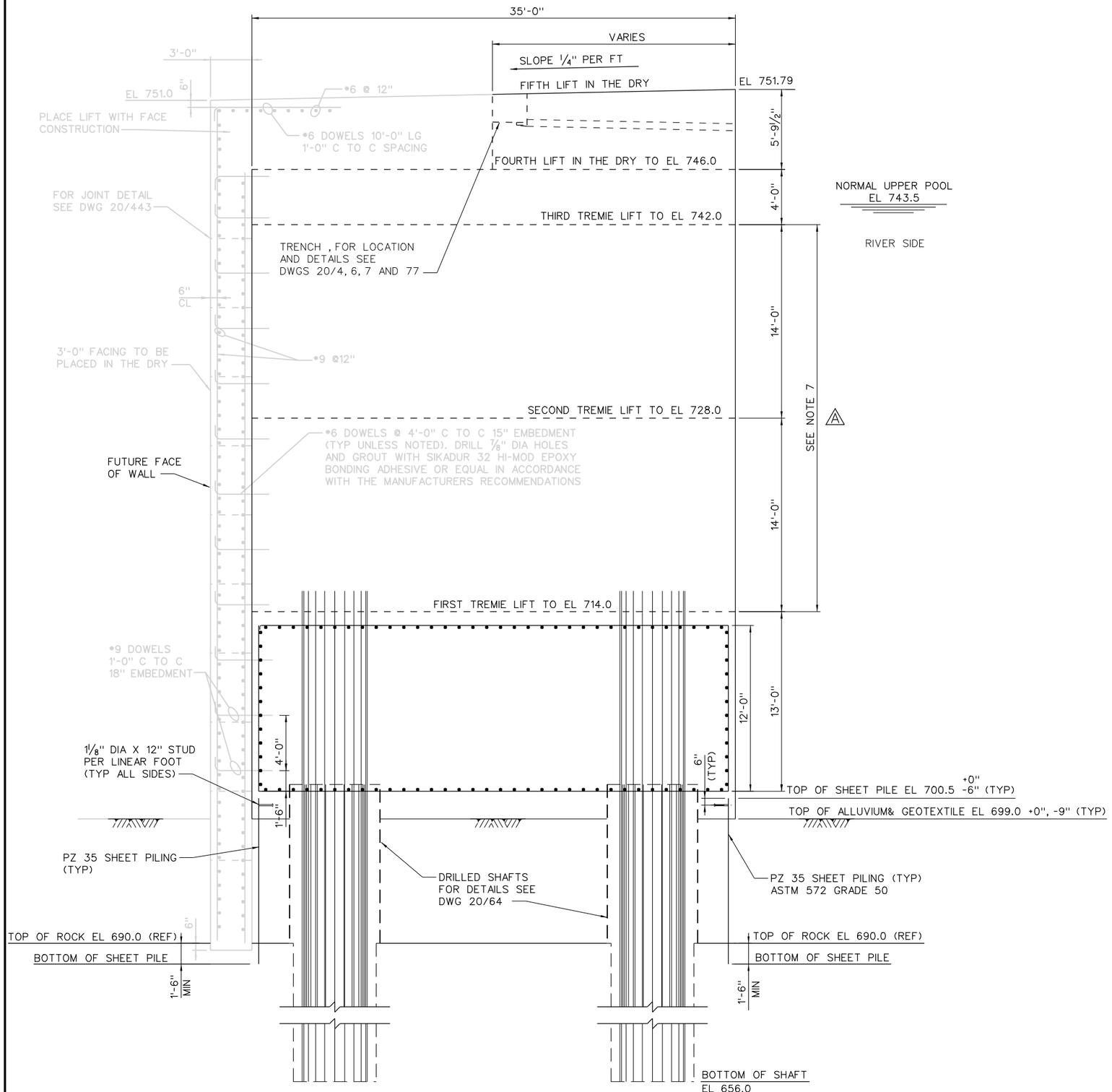

UPSTREAM ELEVATION

(TYPICAL UPPER POOL RIVER WALL)

NOTES:

1. THE MONOLITHS ARE DESIGNED TO BE CONSTRUCTED WITH "IN THE WET" TECHNIQUES. LIFTS FOUR AND FIVE PLACED IN THE DRY. THE RIVER SIDE OF THE FIFTH LIFT SHALL BE PLACE WITH THE INITIAL MONOLITH CONSTRUCTION. THE LAND SIDE OF THE FIFTH LIFT SHALL BE PLACED AT A LATER DATE WITH THE FACING CONSTRUCTION, AFTER DEWATERING OF THE LOCK CHAMBER.
2. WORK THIS DWG WITH DWGS 20/13 AND 20/14.
3. FOR CONSTRUCTION SEQUENCE SEE DWGS 4/43.
4. FOR UPPER GUARD WALL RECESS SEE DWG 20/24.
5. FOR TRENCH LOCATION AND DETAILS SEE DWGS 20/4, 20/6, 20/7 AND 20/77.
6. FOR JOINT AND WATER STOP DETAILS SEE DWG 20/78.
7. THE NUMBER OF TREMIE LIFTS, FOR THE LIFTS IN THE TREMIE PORTION BETWEEN EL 714 AND EL 742 MAY BE INCREASED, OTHER THAN THE FIRST LIFT TO ACCOMMODATE THE CONTRACTOR'S METHODS. NOTE THAT THE TOP OF THE TREMIE LIFTS MUST BE PREPARED FOR PLACEMENT OF SUBSEQUENT LIFTS AND THEREFORE WILL REQUIRE MORE PREPARATION WORK INVOLVED IF THE LIFT HEIGHTS ARE LOWERED AND MORE LIFTS ARE REQUIRED. IN ADDITION, NOTE THAT THERE WILL BE NO REDUCTION OR CHANGES GRANTED FOR THE PLACEMENT RATE (TIME BETWEEN PLACEMENT OF SUBSEQUENT LIFTS), PLACEMENT TEMPERATURE OR OTHER CONCRETE PLACEMENT PARAMETERS BASED ON A REDUCED LIFT HEIGHT.

SCALE: 1/4" = 1'-0"

12" 0 5' 10'

US Army Corps of Engineers
Pittsburgh District

Submitted by: /s/JEANINE HOEY P.E. SECTION CHIEF
Design by: P SURACE P.E.
Drwn by: BEH
Ckd by: JMH
Submission Date: 14 APR 04
Revision Date: X
FB NO.: W911WN
Sheet 1 of 1

User: brian.e.mcfarland
Date: 17-JUN-2004 14:56
Plot Scale: 0.166667'=1.000000
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Color Table

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7	TREMIE POUR NOTE 7 ADDED - AMEND. NO. 5	17 JUN 04	PAS

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MONONGAHELA RIVER
CHARLEROI LOCKS AND DAM
LOCKS - CONTRACT #1
RIVER WALL
MONOLITHS R-8 THRU R-10 AND R-13 THRU R-18
ELEVATION

Drawing Number: 037-LCH-20/12.1

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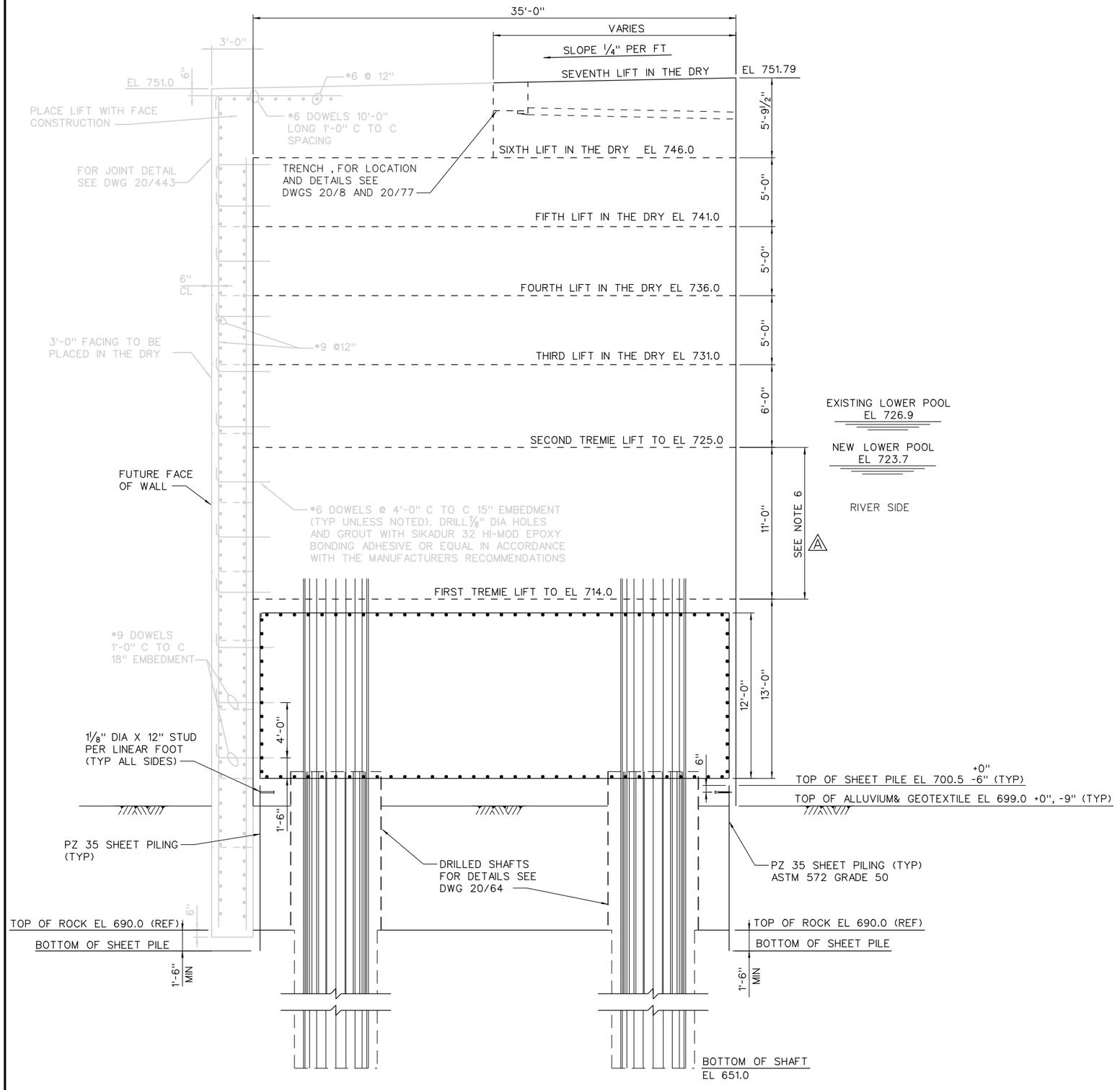

DOWNSTREAM ELEVATION

(TYPICAL LOWER POOL RIVER WALL SECTION)

NOTES:

1. THE MONOLITHS ARE DESIGNED TO BE CONSTRUCTED WITH "IN THE WET" TECHNIQUES. LIFTS THREE THROUGH SEVEN PLACED IN THE DRY. THE RIVER SIDE OF THE SEVENTH LIFT SHALL BE PLACED WITH THE INITIAL MONOLITH CONSTRUCTION. THE LAND SIDE OF THE SEVENTH LIFT SHALL BE PLACED AT A LATER DATE WITH THE FACING CONSTRUCTION, AFTER DEWATERING OF THE LOCK CHAMBER.
2. WORK THIS DWG WITH DWGS 20/16 AND 20/176
3. FOR CONSTRUCTION SEQUENCE SEE DWG 4/43.
4. FOR TRENCH LOCATION AND DETAILS SEE DWGS 20/8 AND 20/77
5. FOR JOINT DETAILS AND WATER STOP SEE DWG 20/78.
6. (A) THE NUMBER OF TREMIE LIFTS FOR THE LIFTS IN THE TREMIE PORTION BETWEEN EL 714 AND EL 725 MAY BE INCREASED, OTHER THAN THE FIRST LIFT, TO ACCOMMODATE THE CONTRACTOR'S METHODS. NOTE THAT THE TOP OF THE TREMIE LIFTS MUST BE PREPARED FOR PLACEMENT OF SUBSEQUENT LIFTS AND THEREFORE WILL REQUIRE MORE PREPARATION WORK INVOLVED IF THE LIFT HEIGHTS ARE LOWERED AND MORE LIFTS ARE REQUIRED. IN ADDITION, NOTE THAT THERE WILL BE NO REDUCTION OR CHANGES GRANTED FOR THE PLACEMENT RATE OTHER (TIME BETWEEN PLACEMENT OF SUBSEQUENT LIFTS), PLACEMENT TEMPERATURE OR OTHER CONCRETE PLACEMENT PARAMETERS BASED ON A REDUCED LIFT HEIGHT.

SCALE: 1/4" = 1'-0"

12" 0 5' 10'

US Army Corps of Engineers
Pittsburgh District

Submitted by: /s/JEANINE HOEY P.E. SECTION CHIEF
FB NO.: W911WN
Sheet 1 of 1

Design by: P SURACE P.E.
Dwn by: BEH
Submission Date: 14 APR 04
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User: brian.e.mcfarland
Date: 17-JUN-2004 14:56
Plot Scale: 0.166667 i.000000
Pen Table:
Color Table

Symbol	Description	Date	Appr.
A	TREMIE POUR NOTE 6 ADDED - AMEND NO.5	17 JUN 04	PAS

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MONONGAHELA RIVER
CHARLEROI LOCKS AND DAM
LOCKS - CONTRACT #1
RIVER WALL
MONOLITHS R-26 THRU R-28 & R-33 THRU R-35
ELEVATION

Drawing Number: 037-LCH-20/15.1

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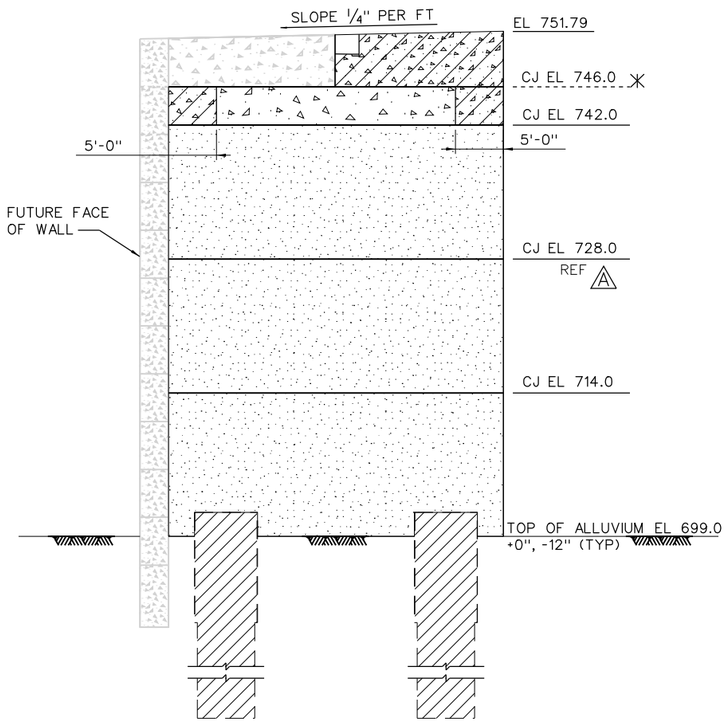
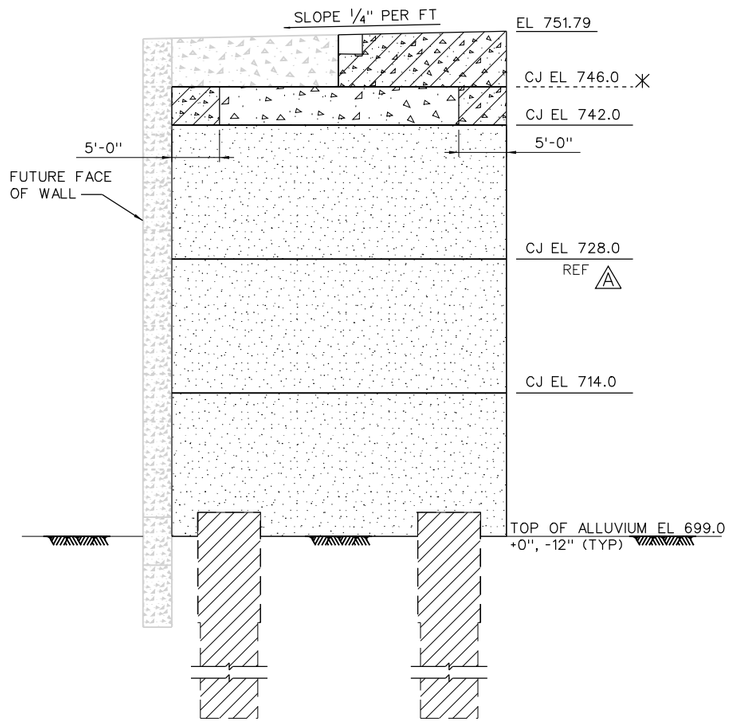


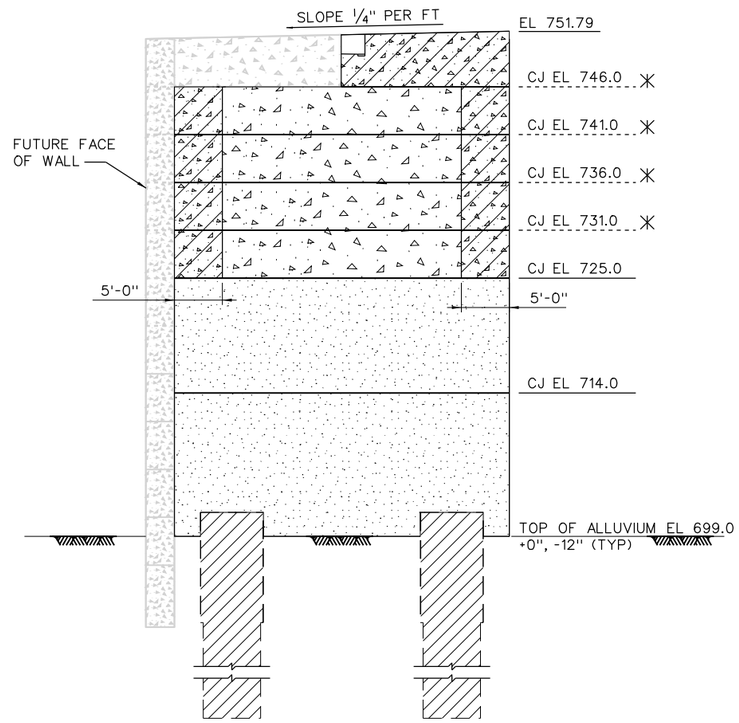
MONOLITHS R-8 THRU R-10

SCALE: 1/8" = 1'-0"



MONOLITHS R-13 THRU R-18

SCALE: 1/8" = 1'-0"



MONOLITHS R-26 THRU R-28
AND R-33 THRU R-35

SCALE: 1/8" = 1'-0"

CAST IN PLACE CONCRETE
f'c = 2500 PSI

CAST IN PLACE CONCRETE
f'c = 3500 PSI

CAST IN PLACE CONCRETE
f'c = 4000 PSI

TREMIE CONCRETE
f'c = 4000 PSI

DRILLED SHAFT CONCRETE
f'c = 5000 PSI

CJ EL XXX.X — CONSTRUCTION JOINT
CHAMFER AT THE FACE

CJ EL XXX.X — CONSTRUCTION JOINT

NOTES:
1. WORK THIS DWG WITH DWGS 20/13, 20/14, 20/16 AND 20/17.

SCALE: 1/8" = 1'-0"
12" 0 5' 10' 15'

US Army Corps of Engineers
Pittsburgh District

Submitted by: /s/JEANINE HOEY P.E. SECTION CHIEF
PFB NO.: W911WN
Sheet 1 of 1

Design by: P SURACE P.E.
Dwn by: BEH
Ckd by: JMH
Submission Date: 14 APR 04
Revision Date: X

User: brian.e.mcfarland
Date: 17-JUN-2004 14:56
Plot Scale: 0.166667:1.000000
Pen Table:
Color Table

Symbol	Description	Date	Appr.
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F:\M-Char Lock-C1\sheet\AM5\20025A-S-2.s01

MONONGAHELA RIVER
CHARLEROI LOCKS AND DAM
LOCKS - CONTRACT #1
RIVER WALL
R-8 - 10, R-13 - 18, R-26 - 28, R-33 - 38
CONCRETE PLACEMENT

Drawing Number:
037-LCH-20/25.1

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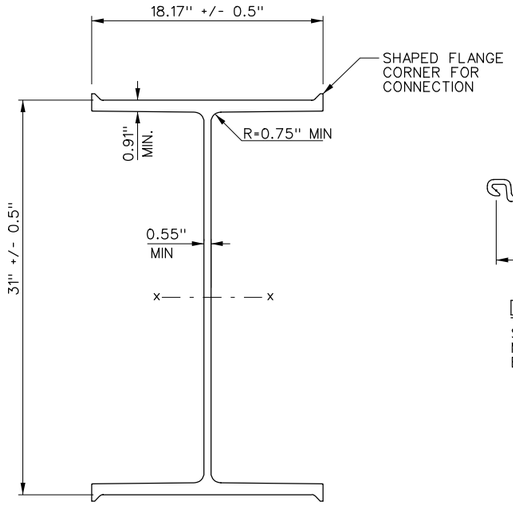
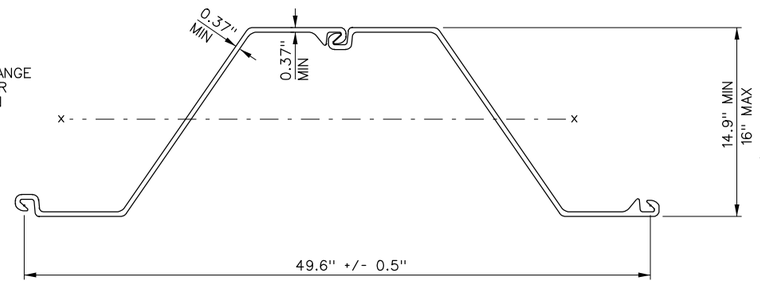


REQUIRED MINIMUM SECTION PROPERTIES

SECTIONAL AREA = 50.4 IN^2
MOMENT OF INERTIA, Ix-x = 8918 IN^4
ELASTIC SECTION MODULUS, Sx-x = 575 IN^3

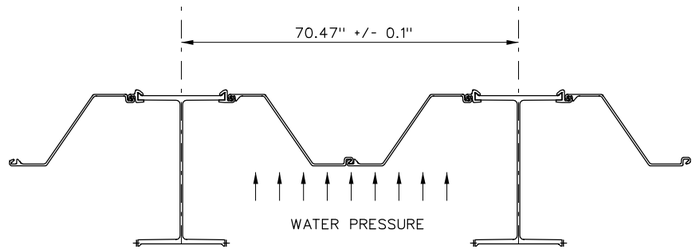
KING PILE SECTION



DOUBLE PILES REQUIRED MINIMUM SECTION PROPERTIES

SECTIONAL AREA = 29.3 IN^2
MOMENT OF INERTIA, Ix-x = 1035 IN^4
ELASTIC SECTION MODULUS, Sx-x = 138 IN^3

Z-PILES SECTION

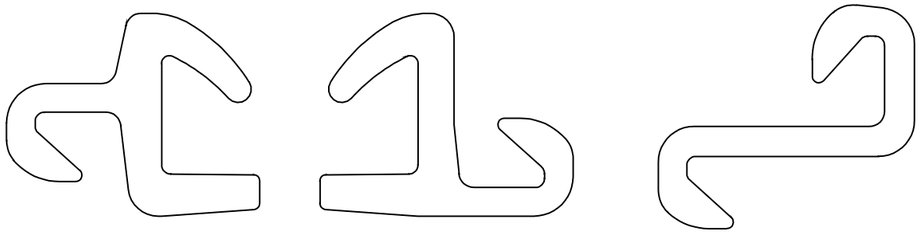


TYPICAL WALL SYSTEM PLAN

SCALE: 3/4" =1'-0"

NOTES:

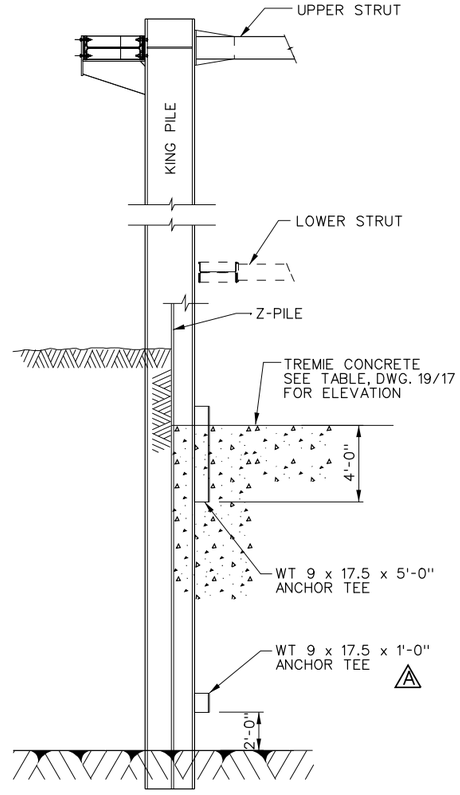
1. WALL SYSTEM SHALL BE RATED BY MANUFACTURER TO WITHSTAND 2,550 PSF MIN. UNFACTORED WATER PRESSURE.
2. SEE SPECIFICATIONS FOR TOLERANCES.



NOTES:

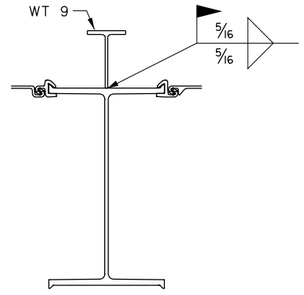
1. CONNECTORS SHOWN ARE TYPICAL SHAPES TO BE USED IN THE COFFERBOX CONSTRUCTION.
2. THE CONNECTOR SHAPES SHALL BE PROVIDED FOR BOTH KING PILE AND Z-PILE CONNECTIONS, AND THEY MAY BE MODIFIED BY THE CONTRACTOR IF APPROVED BY THE CONTRACTING OFFICER
3. THE CONNECTOR DIMENSIONS AND SECTION PROPERTIES SHALL BE SUCH THAT ALL CONNECTORS SHALL HAVE STRENGTH TO RESIST MINIMUM WATER PRESSURE OF 2,550 PSF AND REMAIN WATERTIGHT (NO DECLUTCHING).

CONNECTORS



ELEVATION

SCALE: 1/4" =1'-0"



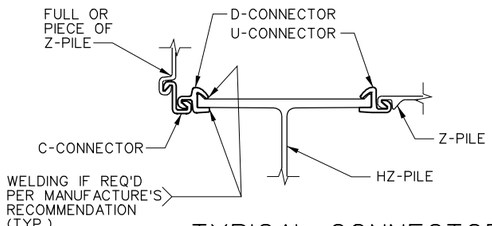
TYPICAL ANCHOR TEE DETAIL

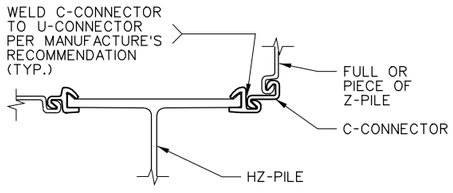
SCALE: 1"=1'-0"

TYPICAL KING PILE ELEVATION AND DETAIL

NOTES:

1. "WT 9" ANCHOR TEE SHALL BE PROVIDED IN THE TREMIE CONCRETE SEAL AT ALL COFFERBOX KING PILES.
2. ALL THE KING PILE "WT 9" ANCHOR TEE LOCATIONS SHALL BE DETERMINED MATHEMATICALLY FROM THE ESTIMATED KING PILE TIP ELEVATION IN THE FIELD.





TYPICAL CONNECTOR APPLICATIONS

SCALE: 1 1/2" =1'-0"

SCALE IN FEET
12" 0 5'
SCALE: 1/4" = 1'-0"

SCALE IN FEET
12" 6" 0 1' 2'
SCALE: 3/4" = 1'-0"

SCALE IN FEET
12" 6" 0 1'
SCALE: 1" = 1'-0"

US Army Corps of Engineers
Pittsburgh District

LISA PIERCE, P.E. — STATE OF WASHINGTON — 30767 — REGISTERED PROFESSIONAL ENGINEER — EXPIRES: 04/29/

Submitted by: LISA PIERCE, P.E. | PED NO.: W911WN

Design by: M. INABA, P.E. | Okd by: LRP | Revision Date: 16 JUN 04

Dwn by: PTM | Submission Date: 2 APR 04

INCA ENGINEERS INC.
User: brian.e.mcfarland
Date: 17-JUN-2004 15:02
Plot Scale: 0.166667 ':1.000000
Pen Table:
Color Table

Symbol	Description	Date	Appr.
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MONONGAHELA RIVER
CHARLEROI LOCKS AND DAM
LOCKS - CONTRACT #1
RIVER-WALL
COFFERBOX
TYPICAL WALL SYSTEM

Drawing Number: 037-LCH-19/26.1

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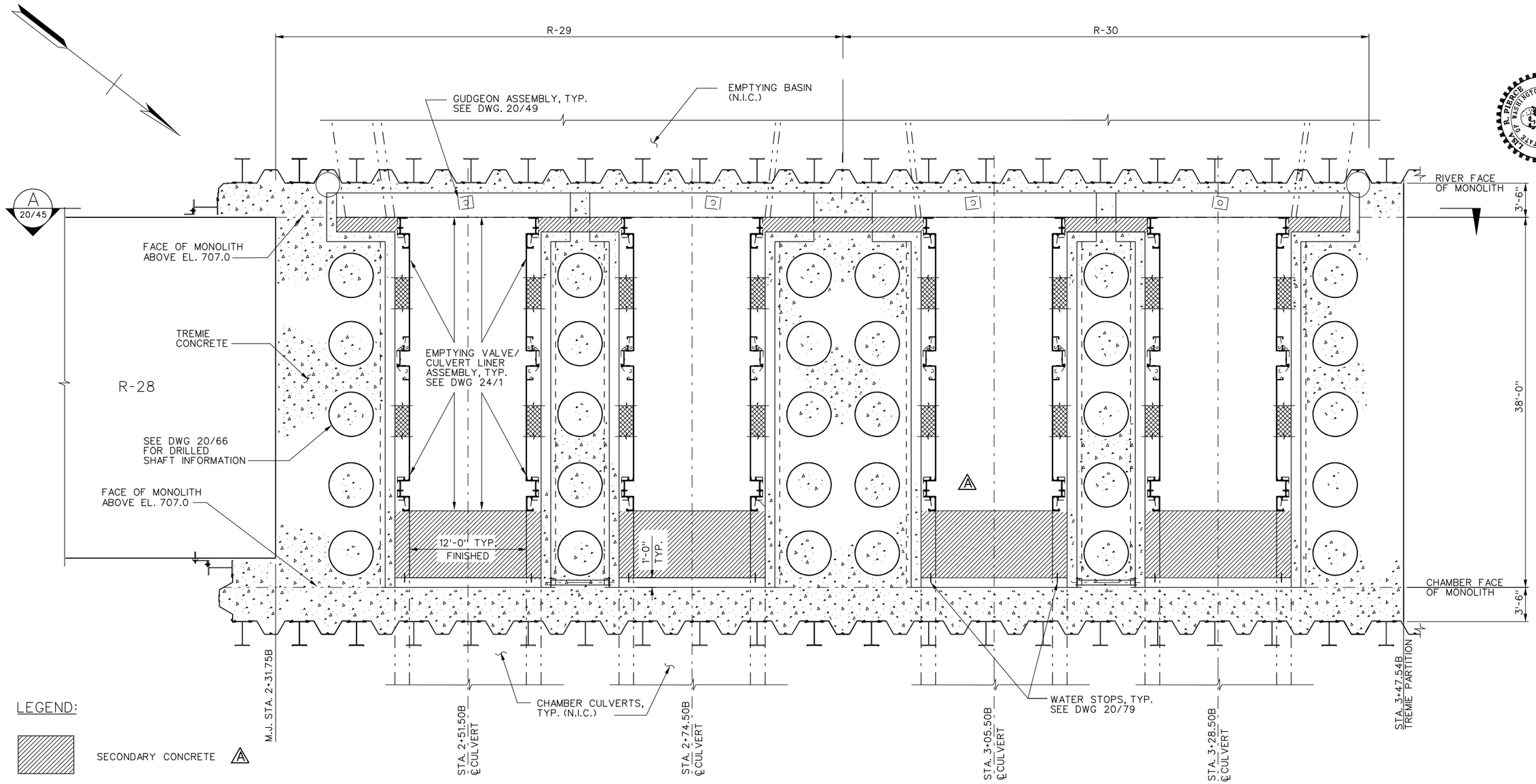


LEGEND:

SECONDARY CONCRETE (A)

CULVERT LINER CONCRETE, (A) SEE STEP 3

STAGE 2 - CONSTRUCTION STEPS:

THE FOLLOWING CONSTRUCTION STEPS OCCUR AFTER COFFERBOX DEWATERING. THESE STEPS ARE REQUIRED FOR COMPLETION OF THE MONOLITHS R-29 AND R-30.

1. INSTALL EMPTYING VALVE / CULVERT LINER ASSEMBLY. REFER TO DWG 24/1 FOR KEY PLAN AND DWG 24/30 FOR INSTALLATION PROCEDURES.
2. REMOVE ALL TREMIE PLATES AND GROUT BRACKETS.
3. PLACE HIGH STRENGTH FLOWABLE CONCRETE (MIX 13) AROUND EMPTYING VALVE/CULVERT LINER ASSEMBLY (CULVERT LINER CONCRETE). REFER TO DWG 24/30 FOR SPECIFIC CONSTRUCTION STEPS. (A)
4. PLACE REINFORCEMENT AND SECONDARY CONCRETE IN AREAS INDICATED TO COMPLETE MONOLITH CULVERT CONSTRUCTION. ALL HARDENED CONCRETE SURFACES WHERE SECONDARY CONCRETE IS TO BE PLACED SHALL BE INTENTIONALLY ROUGHENED. SEE DWG 20/51 FOR LINER REINFORCING. WATER STOPS SHALL BE INSTALLED IN THE CULVERT AT THIS TIME. SEE DWG 20/43 FOR WATER STOP LOCATIONS.
5. CONSTRUCT MONOLITHS.

STAGE 2 - PLAN AT EL 700.0

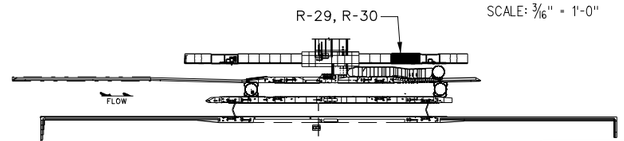
SCALE: 3/16" = 1'-0"

B 20/9 B 20/42

NOTES:

1. FOR R-29 THRU R-32 COFFERBOX CONSTRUCTION SEQUENCE, SEE DWG 4/47.
2. SEE DWG. 20/39 FOR STAGE-1 CONSTRUCTION, BEFORE COFFERBOX DEWATERING.
3. FOR MONOLITH GENERAL PLANS SEE DWG 20/9.
4. ALL SECONDARY CONCRETE SHALL BE HIGH STRENGTH STRUCTURAL CONCRETE (MIX 11) WITH A COMPRESSIVE STRENGTH OF 6000 PSI @ 28 DAYS. (A)

SCALE IN FEET
12" 0 5' 10'
SCALE: 3/16" = 1'-0"



US Army Corps of Engineers
Pittsburgh District

STATE OF WASHINGTON LISA K. PIERCE 30767 REGISTERED PROFESSIONAL ENGINEER
EXPIRES: 04/29/

Submitted by: LISA PIERCE, P.E.
Design by: D. AKESSON
Drawn by: KM
Ckkd by: LRP
Submission Date: 2 APR 04
Revision Date: 15 JUN 04
PB NO.: W911WN
Sheet 2 of 2

INCA ENGINEERS INC.
User: brian.mcfarland
Date: 17-JUN-2004 15:03
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MONONGAHELA RIVER
CHARLEROI LOCKS AND DAM
LOCKS - CONTRACT #1
RIVER WALL
MONOLITHS R-29 AND R-30
PLAN AT EL. 700.00

Drawing Number: 037-LCH-20/40.1

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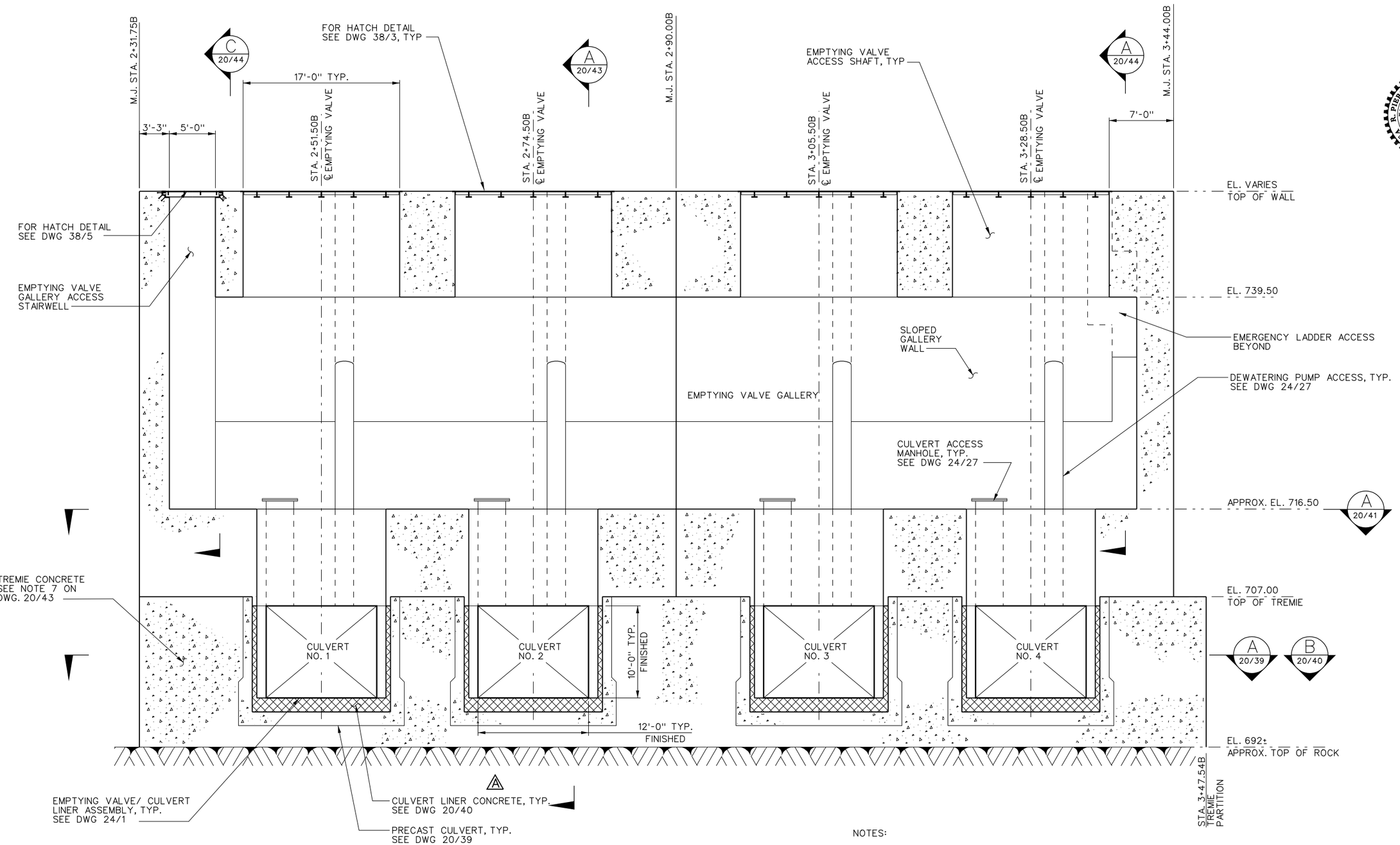

SECTION A 20/9 A 20/41
SCALE: 3/16" = 1'-0"

NOTE: DRILLED SHAFTS, EMPTYING VALVES, STAIRS AND EMERGENCY LADDER NOT SHOWN. EMERGENCY LADDER IS N.I.C.

NOTES:

1. FOR R-29 THRU R-32 COFFERBOX CONSTRUCTION SEQUENCE, SEE DWG 4/47. FOR MONOLITHS R-29, R-30 STAGE 1 - CONSTRUCTION STEPS SEE DWG 20/39. FOR MONOLITHS R-29, R-30 STAGE 2 - CONSTRUCTION STEPS SEE DWG 20/40.
2. FOR MONOLITH GENERAL PLANS SEE DWG 20/9.

LEGEND:

CULVERT LINER CONCRETE A

SCALE IN FEET
12" 0 5' 10'
SCALE: 3/16" = 1'-0"

US Army Corps of Engineers
Pittsburgh District

STATE OF WASHINGTON LISA PIERCE NORTHERN REGISTERED PROFESSIONAL 30767
EXPIRES: 04/29/

Submitted by: LISA PIERCE, P.E.
PB NO.: W911WN
Sheet 1 of 3

Design by: D. AKESSON
Drawn by: TC
Ckd by: LRP
Submission Date: 2 APR 04
Revision Date: 15 JUN 04

INCA ENGINEERS INC.
User: brian.mcfarland
Date: 17-JUN-2004 15:03
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MONONGAHELA RIVER
CHARLEROI LOCKS AND DAM
LOCKS - CONTRACT #1
RIVER WALL
MONOLITHS R-29 AND R-30
SECTIONS AND DETAILS

Drawing Number: 037-LCH-20/42.1

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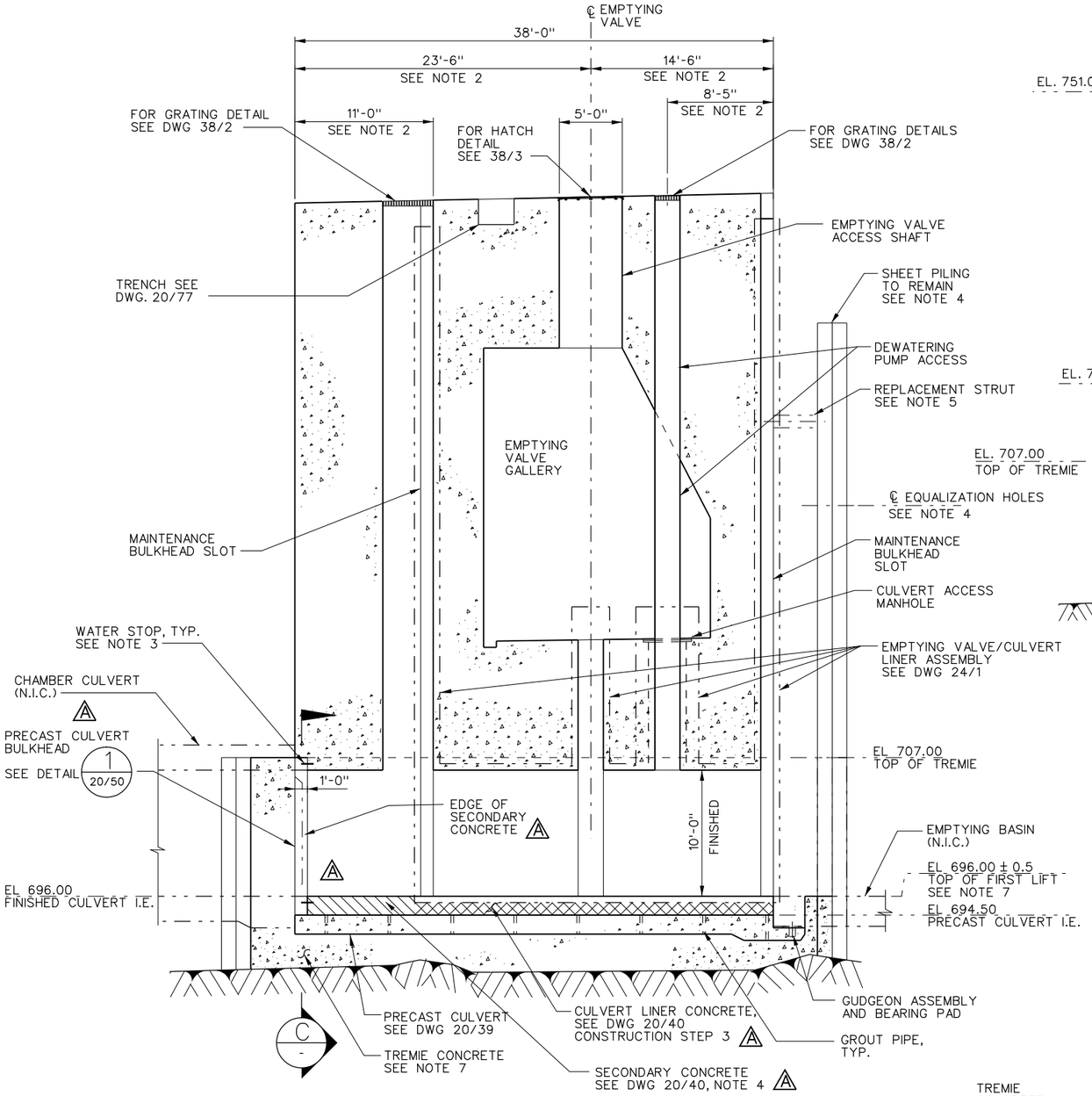
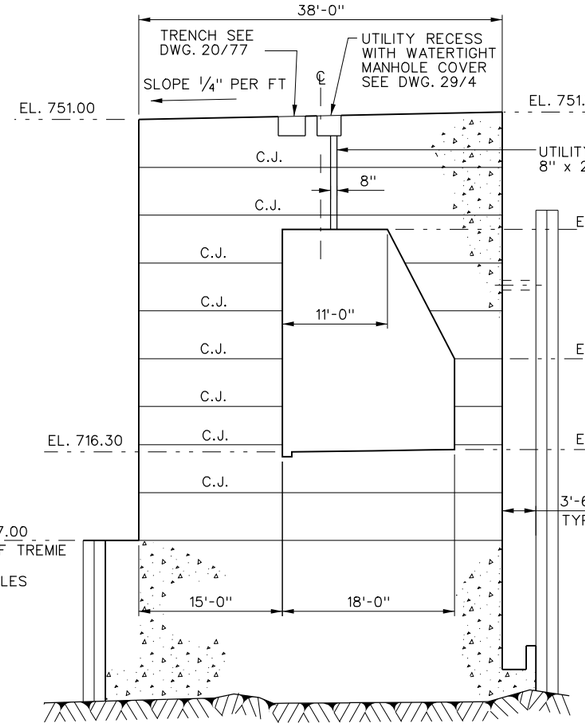


SECTION A 20/9 A 20/41 A 20/42
SCALE: 3/16" = 1'-0"

NOTE:
WALL ARMOR, CORNER PROTECTION, GROUT BRACKET, TREMIE CLOSURE PLATES AND DRILLED SHAFTS NOT SHOWN.



SECTION B 20/9
SCALE: 1/8" = 1'-0"

NOTE:
WALL ARMOR, CORNER PROTECTION, GROUT BRACKET, TREMIE CLOSURE PLATES AND DRILLED SHAFTS NOT SHOWN.

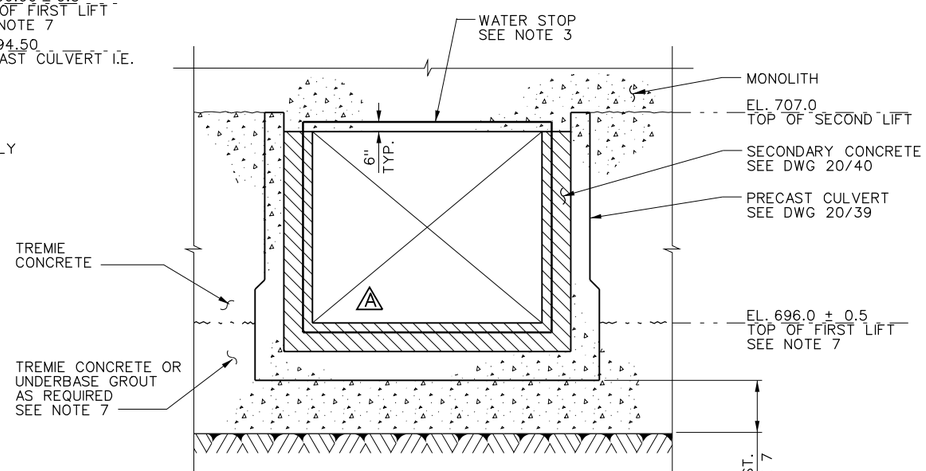
LEGEND:

SECONDARY CONCRETE A

CULVERT LINER CONCRETE A

NOTES:

1. FOR R-29 THRU R-32 COFFERBOX CONSTRUCTION SEQUENCE SEE DWG 4/47. FOR MONOLITHS R-29, R-30 STAGE 1 - CONSTRUCTION STEPS SEE DWG 20/39. FOR MONOLITHS R-29, R-30 STAGE 2 - CONSTRUCTION STEPS SEE DWG 20/40.
2. DIMENSIONS ARE FOR INFORMATION ONLY. DIMENSIONS ARE DEPENDENT ON INSTALLATION OF EMPTYING VALVE/ CULVERT LINER ASSEMBLY. SEE DWGS 24/1, 24/30 AND 24/31 FOR DIMENSIONS.
3. FOR TYPICAL WATER STOP DETAIL SEE DWG 20/79. WATERSTOP TO BE INSTALLED ON RIVER CHAMBER SIDE ONLY.
4. COFFERBOX SHEETPILING TO REMAIN ON RIVER SIDE OF MONOLITHS R-29 THRU R-32. AFTER MONOLITH COMPLETION, EQUALIZATION HOLES (1 SF EACH) SHALL BE CUT INTO THE SHEETPILING AT APPROX. STA. 2+72B AND STA. 3+84B WITH I.E. AT 727.0.
5. FOR REPLACEMENT STRUT LOCATIONS AND DETAILS SEE DWG 19/29. PRIOR TO INSTALLATION OF REPLACEMENTS STRUTS, CONTRACTOR SHALL DESIGN AND INSTALL GALLERY FALSEWORK TO SUPPORT HYDRAULIC LOADS ON COFFERBOX.
6. FOR CONSTRUCTION LIFT JOINT ELEVATIONS SEE DWG 20/34
7. CONTRACTOR SHALL USE A TWO STAGE TREMIE CONCRETE PLACEMENT METHOD. AT THE DISCRETION OF THE CONTRACTING OFFICER, CONTRACTOR MAY BE REQUIRED TO USE UNDERBASE GROUT OR TREMIE CONCRETE FOR THE FIRST LIFT, BASED ON FIELD CONDITIONS. PLACEMENT OF THE FIRST LIFT SHALL OCCUR TO A MIN. EL. OF 696.0 FT ± 0.5 FT.
8. FOR MONOLITH GENERAL PLANS SEE DWG 20/9.



SECTION C -
SCALE: 1/4" = 1'-0"

SCALE IN FEET
12" 0 5' 10' 15'
SCALE: 1/8" = 1'-0"

SCALE IN FEET
12" 0 5' 10'
SCALE: 3/16" = 1'-0"

SCALE IN FEET
12" 0 5'
SCALE: 1/4" = 1'-0"

US Army Corps of Engineers
Pittsburgh District

STATE OF WASHINGTON LISA M. PIERCE 30767 REGISTERED PROFESSIONAL ENGINEER
EXPIRES: 04/29/

Submitted by: LISA PIERCE, P.E.
FB NO.: W911WN
Sheet 2 of 3
Design by: D. AKESSON
Dwn by: TC
Ckd by: LRP
Submission Date: 2 APR 04
Revision Date: 15 JUN 04

INCA ENGINEERS INC.
User: brian.mcfarland
Date: 17-JUN-2004 15:03
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MONONGAHELA RIVER
CHARLEROI LOCKS AND DAM
LOCKS - CONTRACT #1
RIVER WALL
MONOLITHS R-29 AND R-30
SECTIONS AND DETAILS

Drawing Number: 037-LCH-20/43.1

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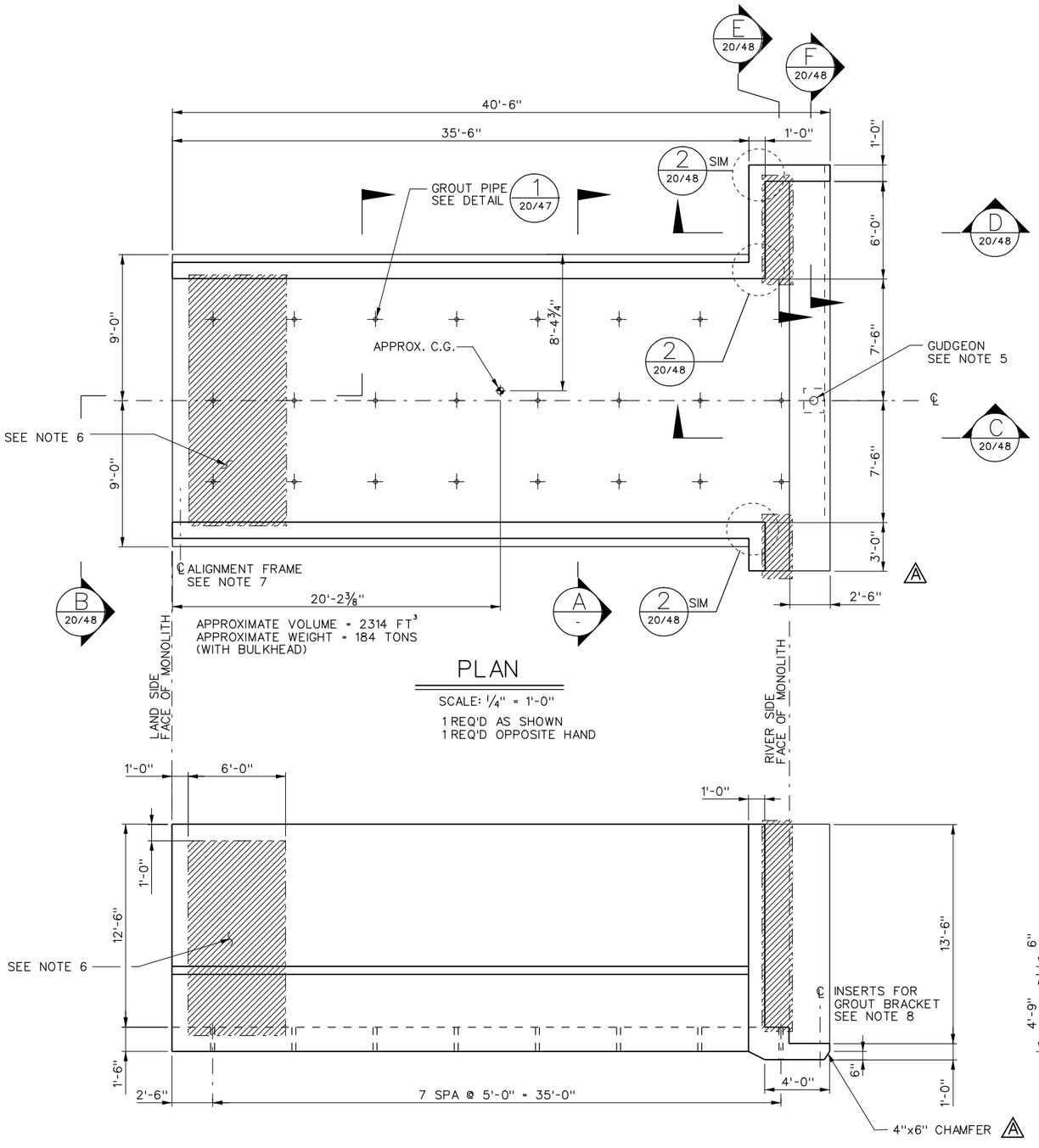


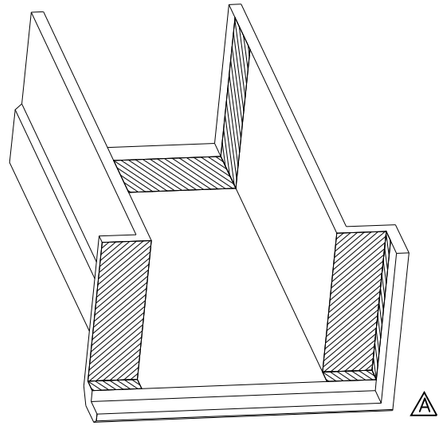
PLAN

SCALE: ¼" = 1'-0"

1 REQ'D AS SHOWN
1 REQ'D OPPOSITE HAND

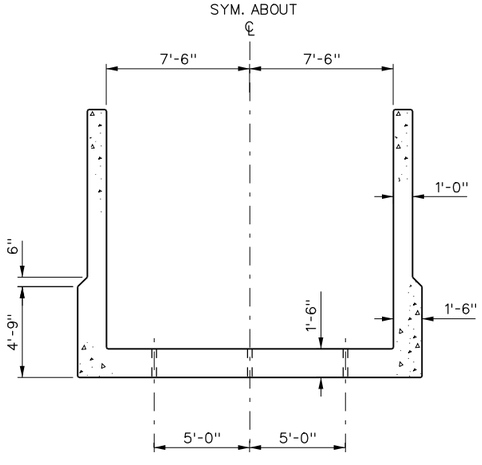
ELEVATION

SCALE: ¼" = 1'-0"



ISOMETRIC

SCALE: NTS
NOTE: GROUT PIPES NOT SHOWN



SECTION A A

SCALE: ¼" = 1'-0"

LEGEND:

INSERT PLACEMENT AREA

NOTES:

1. UNLESS OTHERWISE SHOWN, ALL CORNERS AND EDGES SHALL HAVE A ¾" CHAMFER.
2. THE 28-DAY COMPRESSIVE STRENGTH OF THE PRECAST CULVERT CONCRETE SHALL BE 5000 PSI.
3. FOR PRECAST CULVERT INSTALLATION STEPS, SEE DWGS 4/48 AND 4/49. FOR MONOLITH R-29, R-30 CONSTRUCTION STEPS , SEE DWGS 20/39 AND 20/40.
4. IF THERE IS INTERFERENCE BETWEEN THE EMBEDDED GROUT PIPE AND REINFORCEMENT, ADJUST THE PIPE LOCATION.
5. FOR GUDGEON DETAILS AND LOCATIONS SEE DWG 20/49.
6. PLACE INSERTS FOR #5 DOWELS IN THE ZONE INDICATED. SEE DWG 20/48 FOR INSERT SPACING.
7. PROVIDE INSERTS FOR ALIGNMENT FRAME INSTALLATION. SEE DWGS 20/39 AND 20/87 FOR LOCATIONS AND DETAILS.
8. PROVIDE INSERTS FOR GROUT BRACKET. SEE DWG 20/93 FOR LOCATIONS AND DETAILS.
9. FOR MONOLITH GENERAL PLANS SEE DWG 20/9.

SCALE IN FEET
12" 0 5'
SCALE: ¼" = 1'-0"

US Army Corps of Engineers
Pittsburgh District

LISA A. PIERCE 30767 STATE OF WASHINGTON REGISTERED PROFESSIONAL ENGINEER
EXPIRES: 04/29/

Submitted by: LISA PIERCE, P.E.
PB NO.: W911WN
Design by: D. AKESSON
Dwn by: SL
Ckd by: LRP
Submission Date: 2 APR 04
Revision Date: 15 JUN 04

INCA ENGINEERS INC.
User: brian.e.mcfarland
Date: 17-JUN-2004 15:04
Plot Scale: 0.166667 i:1.000000
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Color Table

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MONONGAHELA RIVER
CHARLEROI LOCKS AND DAM
LOCKS - CONTRACT #1
RIVER WALL
MONOLITHS R-29 AND R-30
PRECAST CULVERT TYPE A

Drawing Number:
037-LCH-20/46.1

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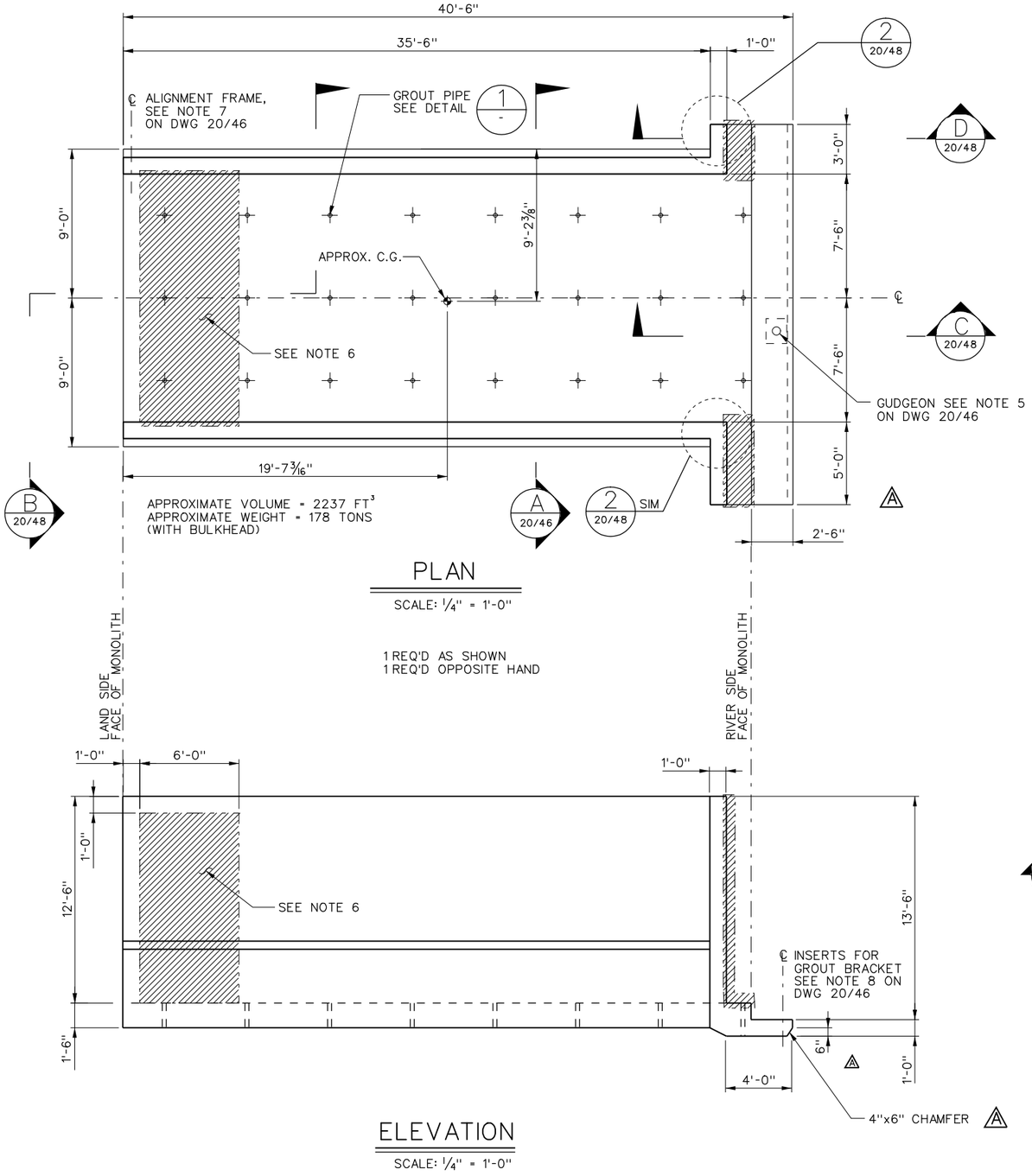


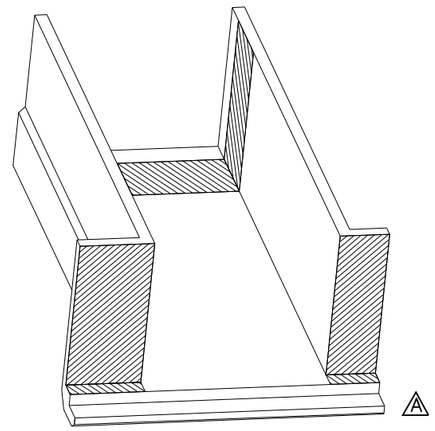
PLAN

SCALE: 1/4" = 1'-0"

1 REQ'D AS SHOWN
1 REQ'D OPPOSITE HAND

ELEVATION

SCALE: 1/4" = 1'-0"



ISOMETRIC

SCALE: NTS

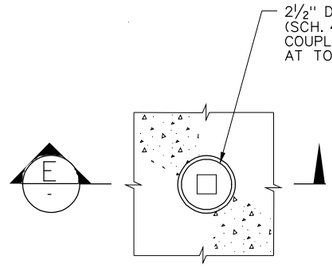
NOTE: GROUT PIPES NOT SHOWN

LEGEND:

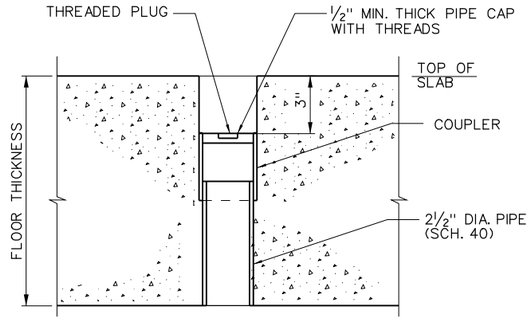
INSERT PLACEMENT AREA

NOTES:

1. SEE NOTES 1 THROUGH 9 ON DWG 20/46.
2. ALL STEEL IN GROUT PIPE ASSEMBLY SHALL BE HOT-DIPPED GALVANIZED.



PLAN



SECTION E -

TYPICAL GROUT PIPE DETAIL 1 - 1 20/39 1 20/46

SCALE: 3" = 1'-0"

SCALE IN FEET
12" 0 5'
SCALE: 1/4" = 1'-0"

SCALE IN INCHES
0 3" 6" 12"
SCALE: 3" = 1'-0"

US Army Corps of Engineers
Pittsburgh District

LISA A. PIERCE 30767 STATE OF WASHINGTON REGISTERED PROFESSIONAL ENGINEER
EXPIRES: 04/29/

Submitted by: LISA PIERCE, P.E.
PB NO.: W911WN

Design by: D. AKESSON
Drawn by: SL
Chkd by: LRP
Submission Date: 2 APR 04
Revision Date: 15 JUN 04

INCA ENGINEERS INC.
User: brian.e.mcfarland
Date: 17-JUN-2004 15:04
Plot Scale: 0.186667:1.000000
Pen Table:
Color Table

Symbol	Description	Date	Appr.
2	REV. TO ADD BOT. CHAMFER - AMEND. NO. 5	17 JUN 04	MI

F:\M-Chor Lock-C1\sheet\AM5\INCA\20047a-s-1.s01

MONONGAHELA RIVER
CHARLEROI LOCKS AND DAM
LOCKS - CONTRACT #1
RIVER WALL
MONOLITHS R-29 AND R-30
PRECAST CULVERT TYPE B

Drawing Number:
037-LCH-20/47.1

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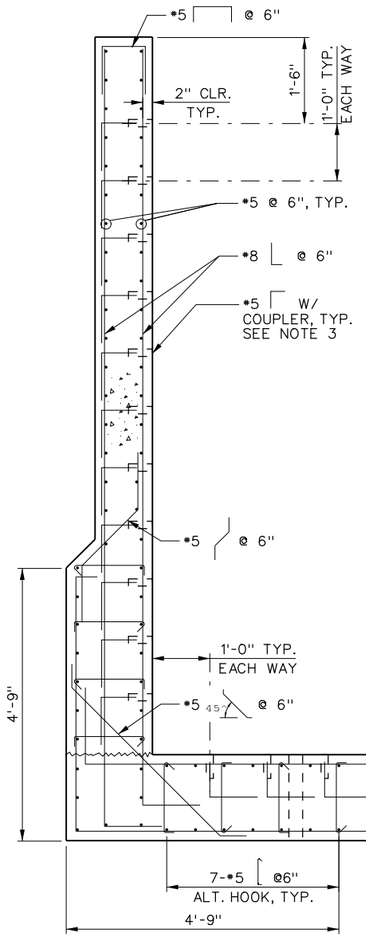
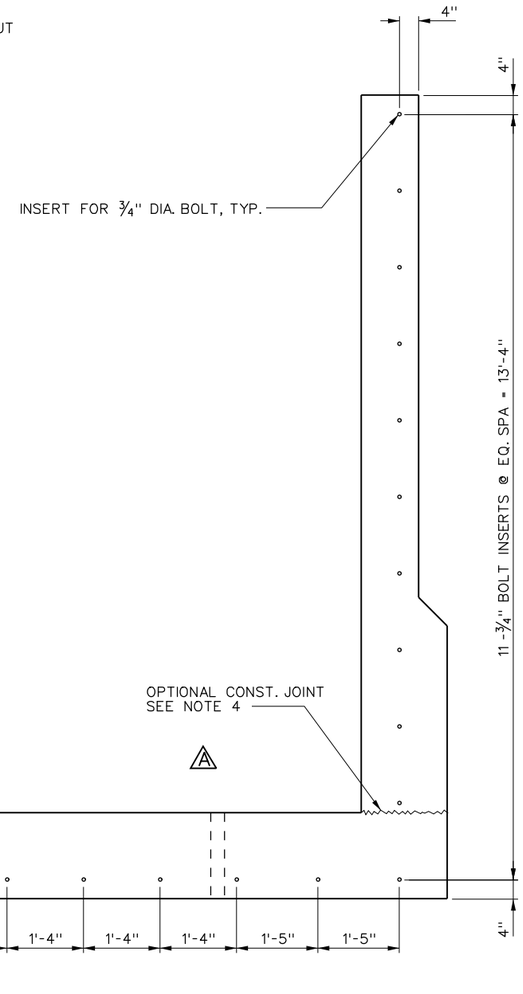
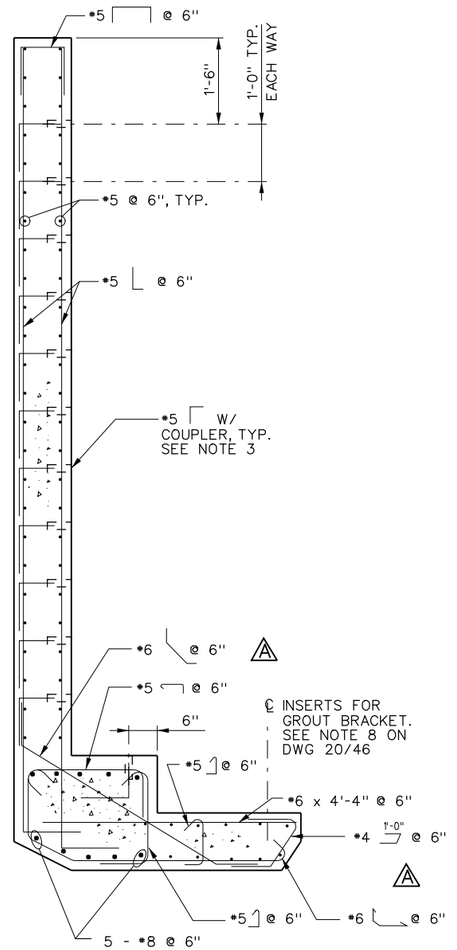
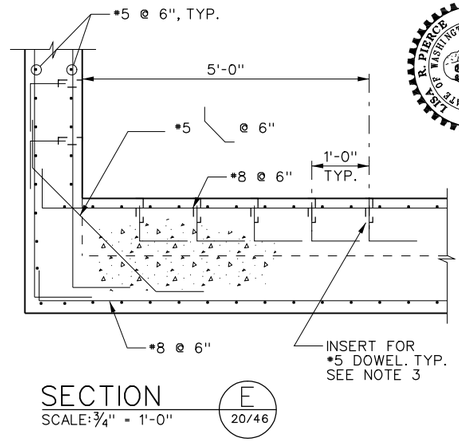


SECTION B B
SCALE: 3/4" = 1'-0"

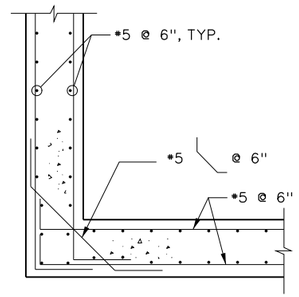




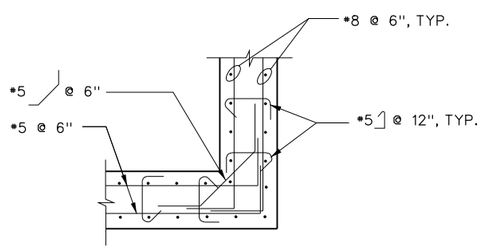
SECTION D D
SCALE: 3/4" = 1'-0"
20/46 20/47



SECTION E
SCALE: 3/4" = 1'-0"
20/46

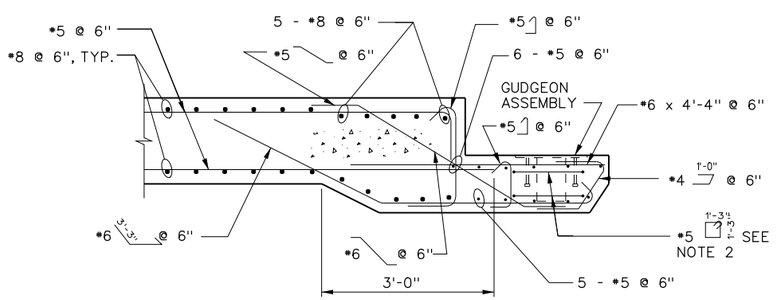


SECTION F
SCALE: 3/4" = 1'-0"
20/46



DETAIL 2 2
SCALE: 3/4" = 1'-0"
20/46 20/47

NOTE: COUPLERS NOT SHOWN.



SECTION C C
SCALE: 3/4" = 1'-0"
20/46 20/47 A

NOTES:

1. FOR BULKHEAD DETAILS SEE DWG 20/50.
2. PLACE BARS CLOSED STIRRUP AROUND GUDGEON ASSEMBLY ONLY.
3. SEE DWG 20/46 AND 20/47 FOR APPLICABLE AREAS TO ADD COUPLERS. SEE DWG 20/59 FOR DOWELS TO BE PLACE IN COUPLERS FOR SECONDARY CONCRETE (CULVERT LINER) REINFORCING.
4. IF CONST. JOINT IS USED, CONTRACTOR SHALL INTENTIONALLY ROUGHEN SURFACE.

SCALE IN FEET
12" 6" 0 1' 2'
SCALE: 3/4" = 1'-0"

US Army Corps of Engineers
Pittsburgh District

LISA PIERCE, P.E.
STATE OF WASHINGTON 30767 REGISTERED PROFESSIONAL ENGINEER
EXPIRES: 04/29/

Submitted by: LISA PIERCE, P.E.
PB NO.: W911WN
Design by: D. AKESSON
Dwn by: SL
Ckd by: LRP
Submission Date: 2 APR 04
Revision Date: 15 JUN 04

INCA ENGINEERS INC.
User: brian.e.mcfarland
Date: 17-JUN-2004 15:05
Plot Scale: 0.166667 i.000000
Pen Table:
Color Table

Symbol	Description	Date	Appr.
A	REV. TO ADD BOT. CHAMFER - AMEND. NO. 5	17 JUN 04	MI

F:\M-Char Lock-C1\sheet\AM5\INCA\20048a-s-5.s01

MONONGAHELA RIVER
CHARLEROI LOCKS AND DAM
LOCKS - CONTRACT #1
RIVER-WALL
MONOLITHS R-29 AND R-30
PRECAST CULVERT REINFORCEMENT

Drawing Number: 037-LCH-20/48.1

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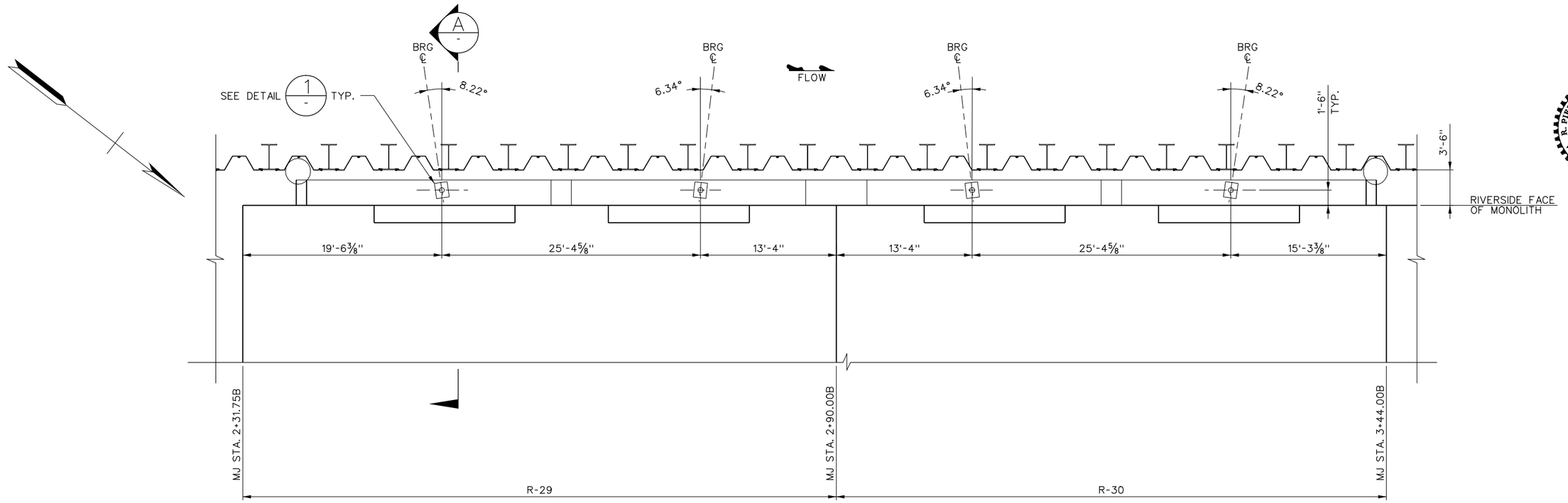
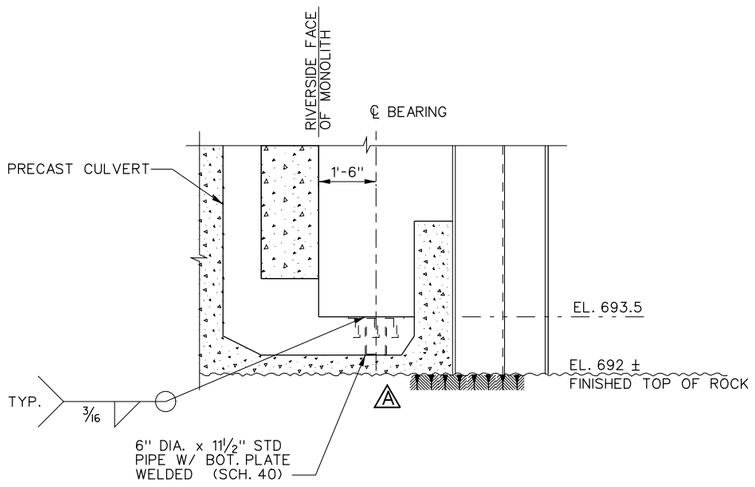


GUDGEON LOCATION PLAN

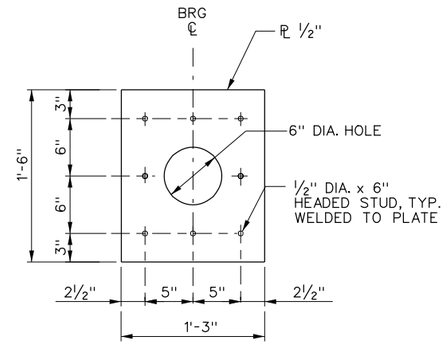
SCALE: ⅜" = 1'-0"



SECTION A

SCALE: ½" = 1'-0"

NOTE: GROUT BRACK, TREMIE CLOSURE PLATES NOT SHOWN.



DETAIL 1

SCALE: 1½" = 1'-0"

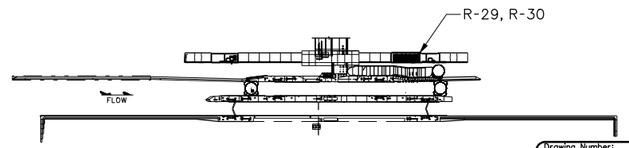
NOTES:

1. FIELD-MEASURE PINTLE GUDGEON COORDINATES AND ELEVATIONS IN PRECAST CULVERT LEDGES AND RECORD THE DATA FOR FUTURE EMPTYING BASIN INSTALLATION. CONTRACTOR SHALL PROVIDE THIS INFORMATION TO THE CONTRACTING OFFICER.
2. ALL STEEL PLATES SHALL BE ASTM A36, UNLESS NOTED OTHERWISE.
3. ALL HEADED STUDS SHALL CONFORM TO ASTM A108, UNLESS NOTED OTHERWISE.
4. ALL PIPE SHALL BE ASTM A53, UNLESS NOTED OTHERWISE.
5. THE GUDGEON ASSEMBLIES SHALL BE HOT-DIPPED GALVANIZED.

SCALE IN FEET
12" 9" 6" 3" 0 1'
SCALE: 1½" = 1'-0"

SCALE IN FEET
12" 0 5' 10'
SCALE: ⅜" = 1'-0"

SCALE IN FEET
12" 0 1' 2' 3' 4'
SCALE: ½" = 1'-0"



US Army Corps of Engineers
Pittsburgh District

LISA K. PIERCE WASHINGTON 30767 REGISTERED PROFESSIONAL ENGINEER
EXPIRES: 04/29/

Submitted by: LISA PIERCE, P.E.
PB NO.: W911WN
Design by: J. ZHANG, P.E.
Drwn by: KT
Ckd by: LRP
Submission Date: 2 APR 04
Revision Date: 15 JUN 04

INCA ENGINEERS INC.
User: brian.mcfarland
Date: 17-JUN-2004 15:05
Plot Scale: 0.166667'=1.000000
Pen Table:
Color Table

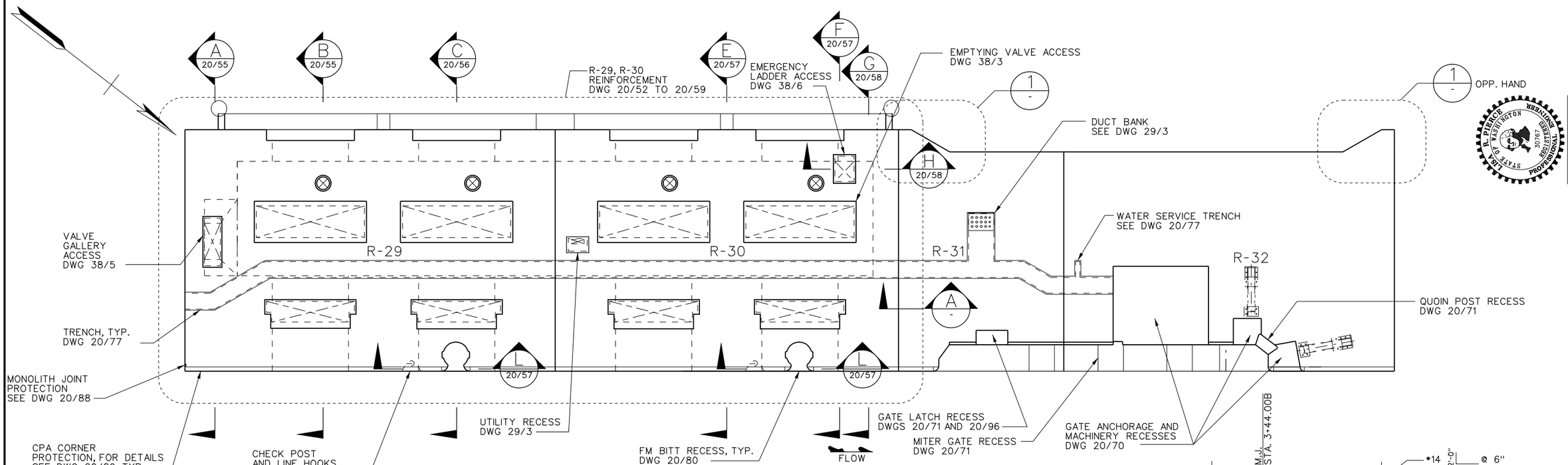
Symbol	Description	Date	Appr.
1	REV. TO ADD BOT. CHAMFER - AMEND. NO. 5	17 JUN 04	MI

F:\M-Char Lock-C1\sheet\AMS\INCA\20049a-s-5.s01

MONONGAHELA RIVER
CHARLEROI LOCKS AND DAM
LOCKS - CONTRACT #1
RIVER WALL
MONOLITHS R-29 AND R-30
GUDGEON PLAN AND DETAILS

Drawing Number:
037-LCH-20/49.1

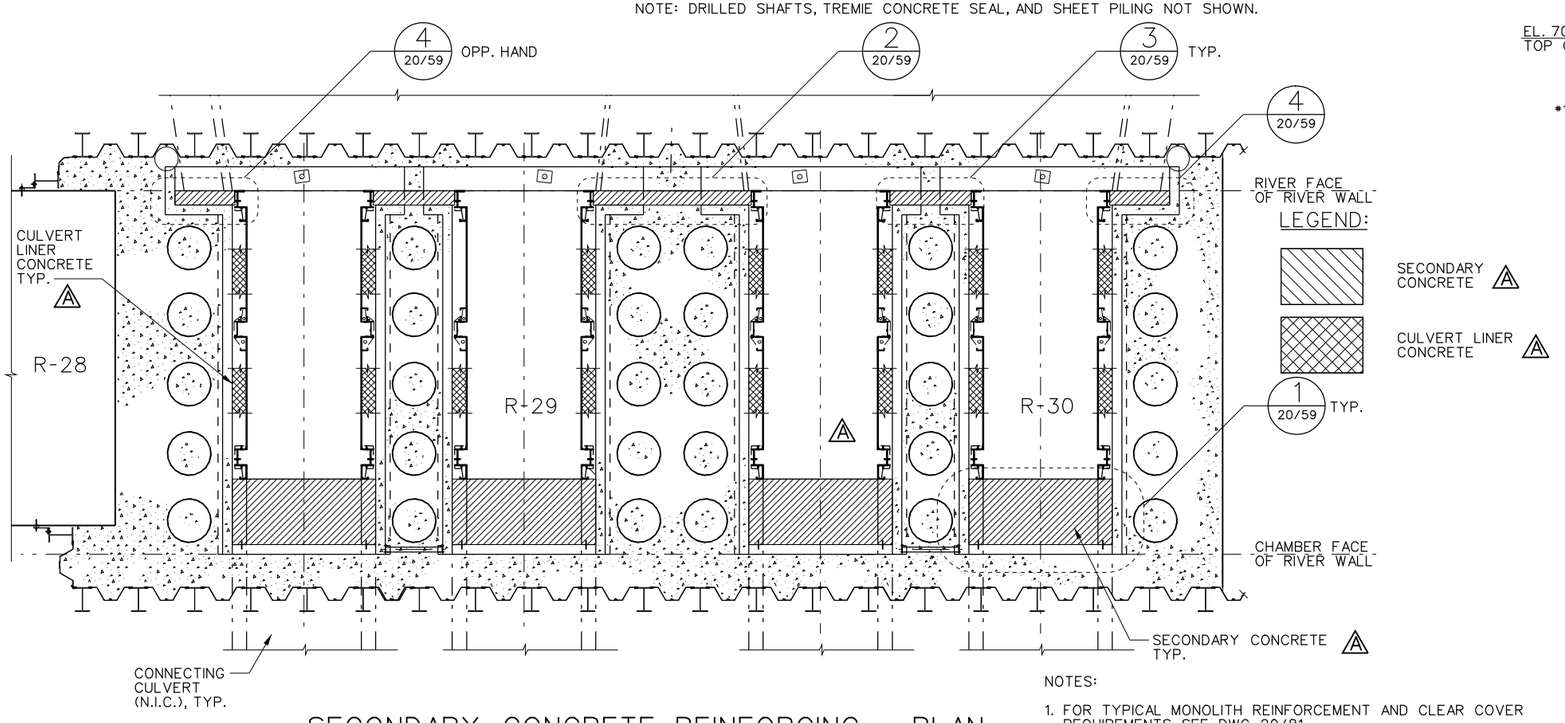
This page was intentionally left blank for duplex printing.



REINFORCING KEY PLAN - RIVER WALL MONOLITHS R-29 THRU R-32

SCALE: 1/8" =1'-0"

NOTE: DRILLED SHAFTS, TREMIE CONCRETE SEAL, AND SHEET PILING NOT SHOWN.

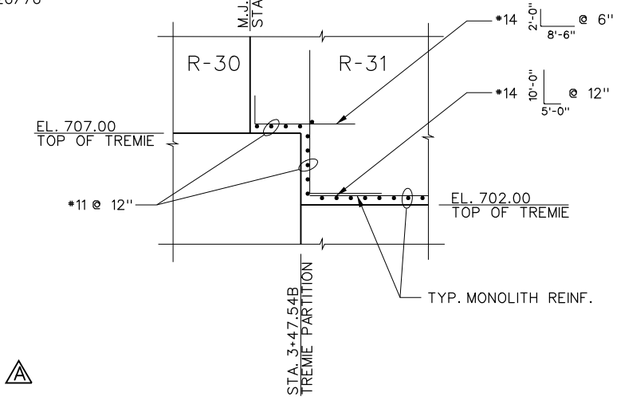


SECONDARY CONCRETE REINFORCING - PLAN

SCALE: 1/8" =1'-0"

NOTES:

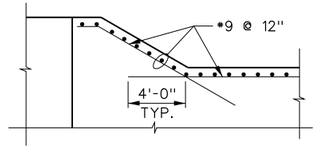
1. FOR TYPICAL MONOLITH REINFORCEMENT AND CLEAR COVER REQUIREMENTS SEE DWG 20/81.
2. FOR MONOLITH GENERAL PLANS SEE DWG 20/9.
3. FOR DRILLED SHAFT REINFORCEMENT SEE DWGS 20/65 AND 20/66.



SECTION A

SCALE: 3/16" = 1'-0"

NOTE: CUT OFF EXCESS TREMIE PARTITION FLUSH WITH TOP OF TREMIE CONCRETE.



DETAIL 1

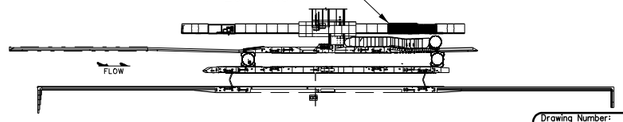
SCALE: 3/16" = 1'-0"

SCALE IN FEET 12" 0 5' 10'

SCALE: 3/16" = 1'-0"

SCALE IN FEET 12" 0 5' 10' 15'

SCALE: 1/8" = 1'-0"



US Army Corps of Engineers
Pittsburgh District

LISA PIERCE, P.E. — 30767 — STATE OF WASHINGTON — REGISTERED PROFESSIONAL ENGINEER — EXPIRES: 04/29/

Submitted by: LISA PIERCE, P.E. | PB NO.: W911WN

Design by: D. AKESSON | Ckd by: LRP | Revision Date: 15 JUN 04

Dwn by: VR | Submission Date: 2 APR 04

INCA ENGINEERS INC.

User: brian.mcfarland
Date: 17-JUN-2004 15:06
Plot Scale: 0.166667 ft/000000
Pen Table:
Color Table

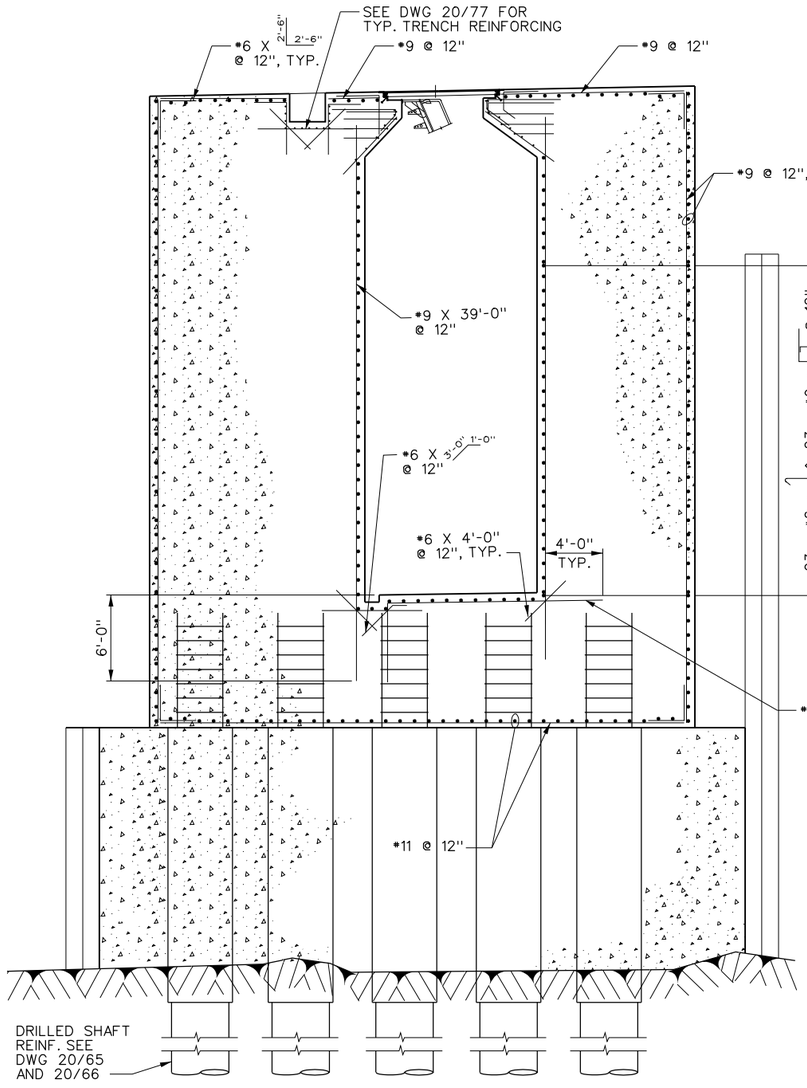
Symbol	Description	Date	Appr.
A	CLARIFY CONC. TYPES & DELETE FILLET - AMEND. NO. 1	17 JUN 04	LRP

F:\M-Char Lock-C1\sheet\AM5\INCA\20051A-s-5.s01

MONONGAHELA RIVER
CHARLEROI LOCKS AND DAM
LOCKS - CONTRACT #1
RIVER WALL
MONOLITHS R-29 THRU R-32
REINFORCEMENT KEY PLAN

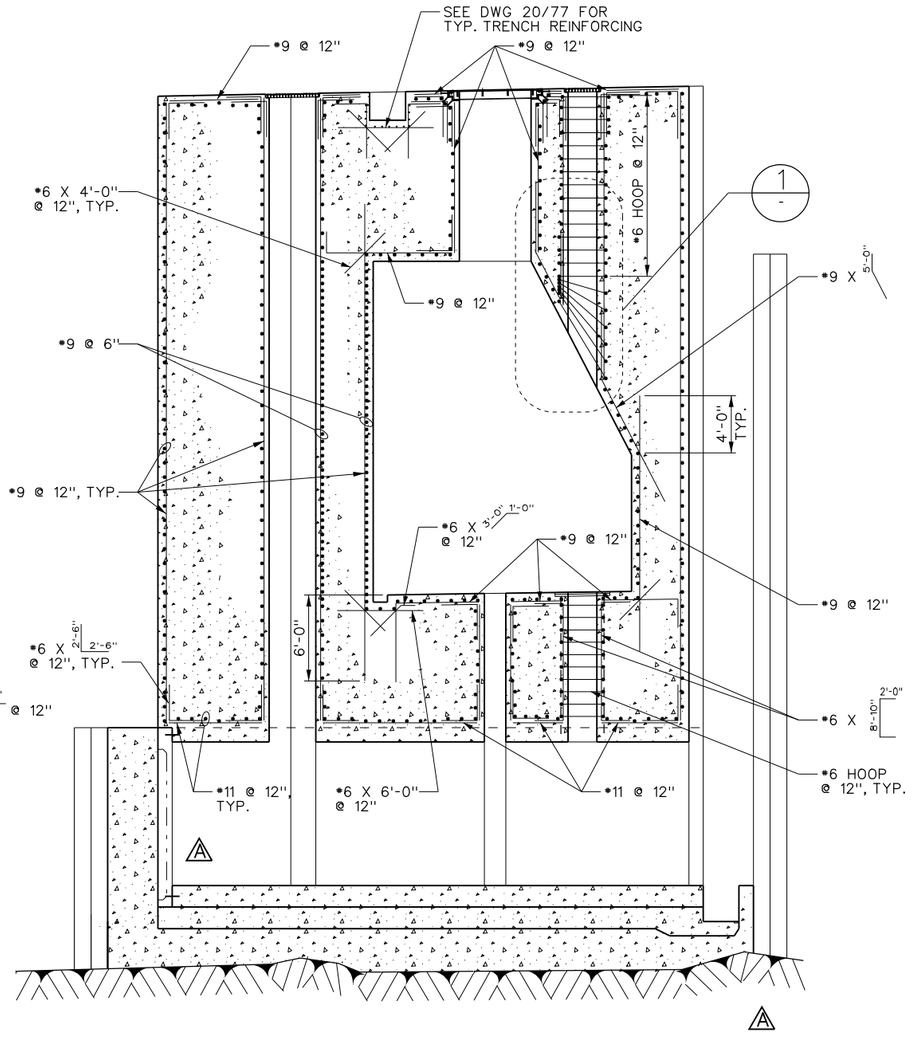
Drawing Number: 037-LCH-20/51.1

This page was intentionally left blank for duplex printing.



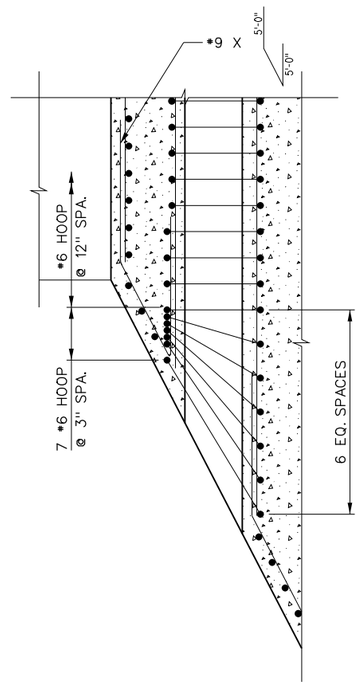
SECTION A
SCALE: 3/16" = 1'-0"
20/51

NOTE: WALL ARMOR AND CORNER PROTECTION NOT SHOWN.



SECTION B
SCALE: 3/16" = 1'-0"
20/51

NOTE: WALL ARMOR, CORNER PROTECTION AND DRILLED SHAFTS NOT SHOWN.



DETAIL 1
SCALE: 3/8" = 1'-0"
-

NOTE:

FOR MONOLITH REINFORCEMENT KEY PLAN SEE DWG 20/51.

SCALE IN FEET
12" 0 2' 4' 6'
SCALE: 3/8" = 1'-0"

SCALE IN FEET
12" 0 5' 10'
SCALE: 3/16" = 1'-0"

US Army Corps of Engineers
Pittsburgh District

LISA K. PIERCE — STATE OF WASHINGTON — 30767 — REGISTERED PROFESSIONAL ENGINEER
EXPIRES: 04/29/

Submitted by: LISA PIERCE, P.E.
PB NO.: W911WN
Sheet 4 of 8

Design by: J. ZHANG, P.E.
Drawn by: SL
Chkd by: LRP
Submission Date: 2 APR 04
Revision Date: 15 JUN 04

INCA ENGINEERS INC.

User: brian.mcfarland
Date: 17-JUN-2004 15:06
Plot Scale: 0.166667'=1.000000
Pen Table:
Color Table

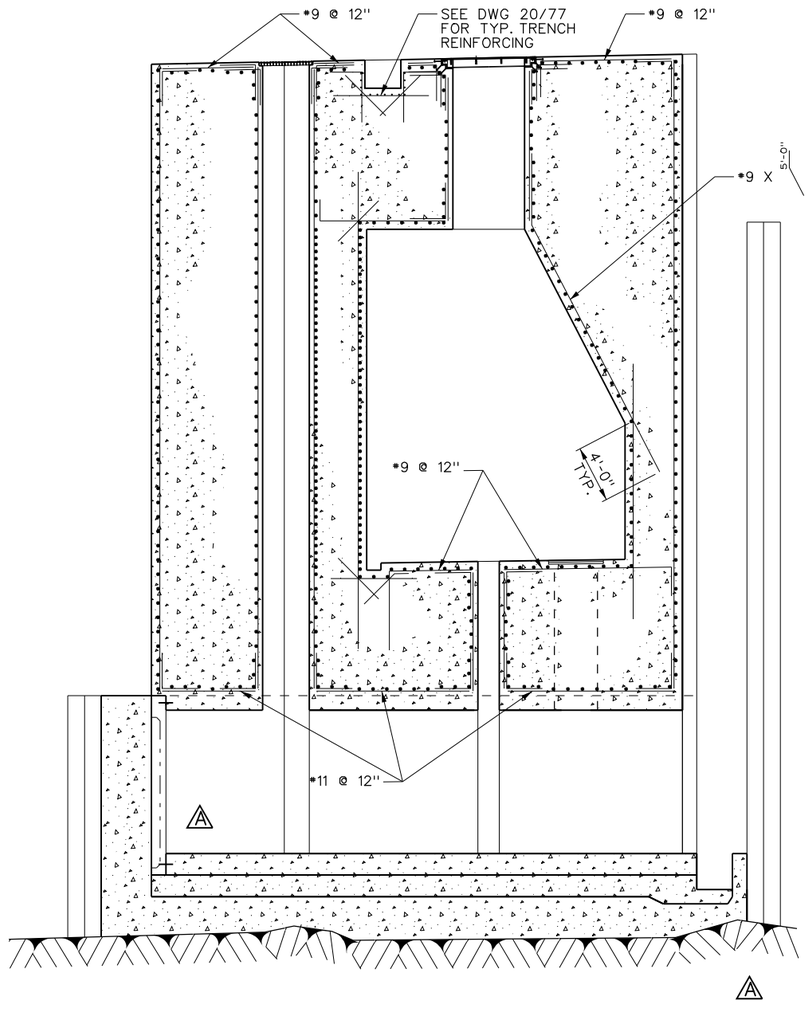
Symbol	Description	Date	Appr.
1	DELETE FILLET & ADD CHAMFER - AMEND. NO. 5	17 JUN 04	LRP

F:\M-Char Lock-C1\sheet\AM5\INCA\20055a-s-5.s01

MONONGAHELA RIVER
CHARLEROI LOCKS AND DAM
LOCKS - CONTRACT #1
RIVER-WALL
MONOLITHS R-29 AND R-30
REINFORCING DETAILS

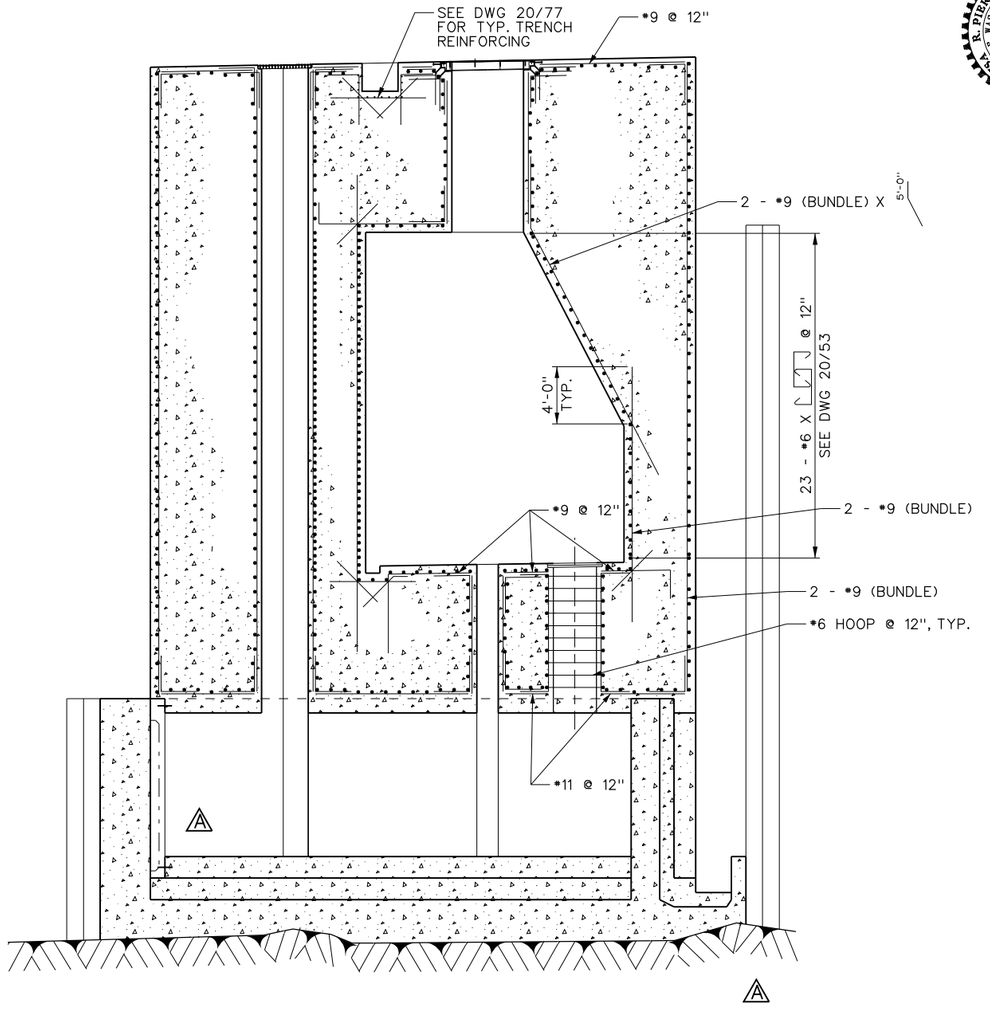
Drawing Number:
037-LCH-20/55.1

This page was intentionally left blank for duplex printing.



SECTION C
SCALE: 3/16" = 1'-0"
20/51

NOTE: WALL ARMOR, CORNER PROTECTION, DRILLED SHAFTS AND FM BITT RECESS NOT SHOWN. FOR REINFORCEMENT NOT CALLED OUT, SEE SECTION B 20/55



SECTION D
SCALE: 3/16" = 1'-0"
20/54

NOTE: WALL ARMOR, CORNER PROTECTION AND DRILLED SHAFTS NOT DRILLED SHAFT NOT SHOWN. FOR REINFORCEMENT NOT CALLED OUT, SEE SECTION B 20/55

NOTE:

FOR MONOLITH REINFORCEMENT KEY PLAN SEE DWG 20/51.

SCALE IN FEET
12" 0 5' 10'
SCALE: 3/16" = 1'-0"

US Army Corps of Engineers
Pittsburgh District

LISA K. PIERCE — STATE OF WASHINGTON — 30767 — REGISTERED PROFESSIONAL ENGINEER
EXPIRES: 04/29/

Submitted by: LISA PIERCE, P.E.
Design by: J. ZHANG, P.E.
Dwn by: SL
Ckd by: LRP
Submission Date: 2 APR 04
Revision Date: 15 JUN 04
FB NO.: W911WN
Sheet 5 of 8

INCA ENGINEERS INC.
User: brian.mcfarland
Date: 17-JUN-2004 15:07
Plot Scale: 0.166667'/1.000000
Pen Table:
Color Table

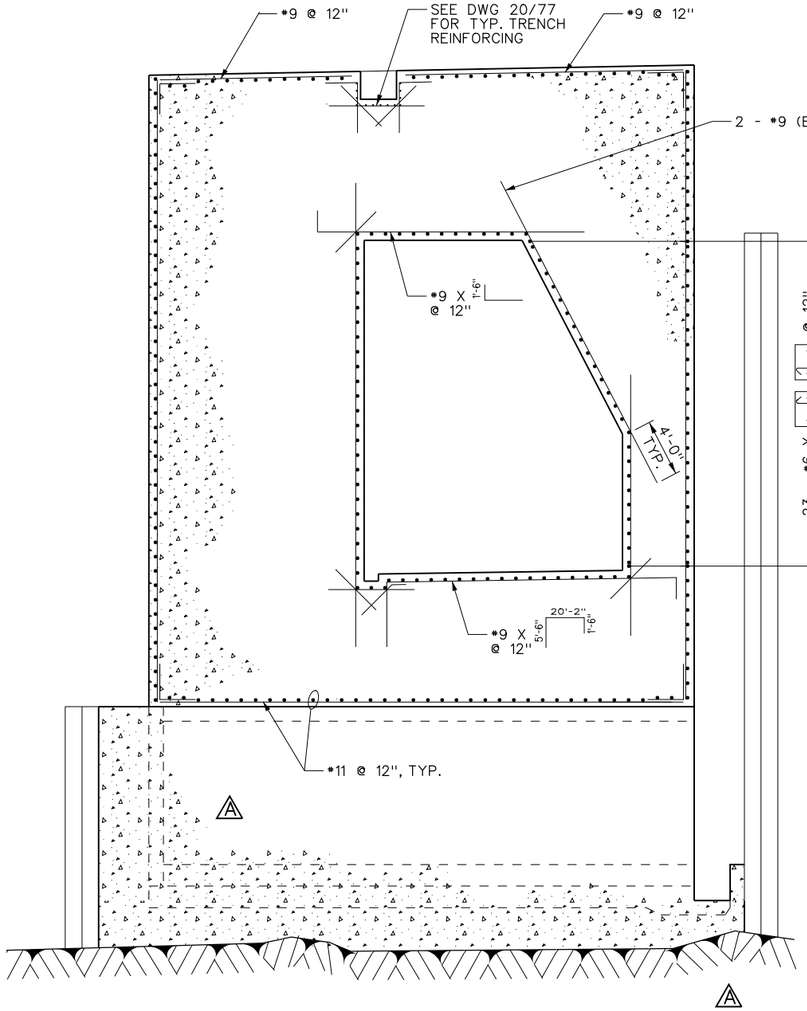
Symbol	Description	Date	Appr.
1	DELETE FILLET & ADD CHAMFER - AMEND. NO. 5	17 JUN 04	LRP

F:\M-Char Lock-C1\sheet\AM5\INCA\20056a-s-5.s01

MONONGAHELA RIVER
CHARLEROI LOCKS AND DAM
LOCKS - CONTRACT #1
RIVER WALL
MONOLITHS R-29 AND R-30
REINFORCING DETAILS

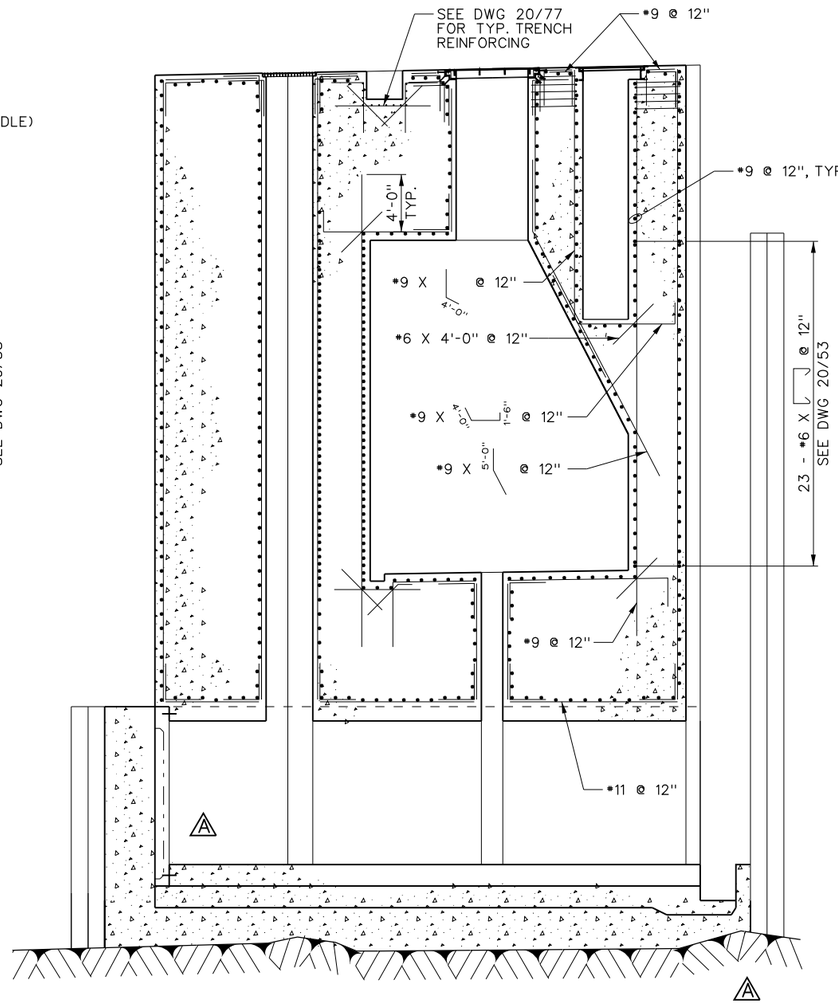
Drawing Number: 037-LCH-20/56.1

This page was intentionally left blank for duplex printing.



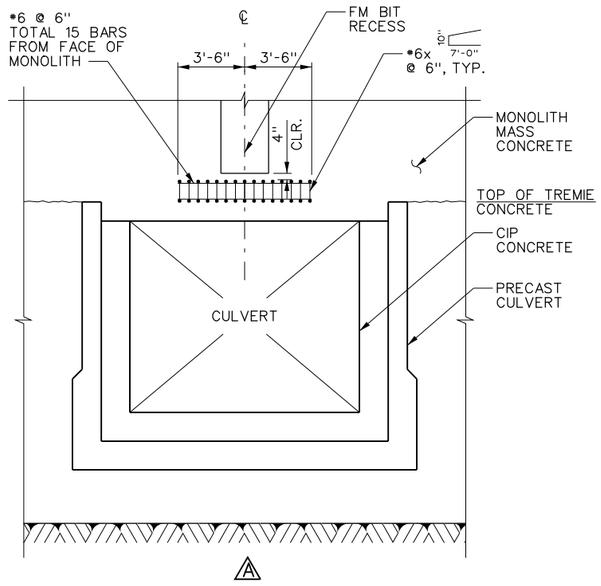
SECTION E
SCALE: 3/16" = 1'-0"
20/51

NOTE: WALL ARMOR, CORNER PROTECTION AND DRILLED SHAFTS NOT SHOWN.



SECTION F
SCALE: 3/16" = 1'-0"
20/51

NOTE: WALL ARMOR, CORNER PROTECTION, LADDER RUNGS AND DRILLED SHAFTS NOT SHOWN.



SECTION L
SCALE: 1/4" = 1'-0"
20/51

NOTE: TYPICAL REINFORCEMENT FOR MONOLITH, PRECAST CULVERT, AND CIP CONC. NOT SHOWN.

NOTES:

1. FOR MONOLITH REINFORCEMENT KEY PLAN SEE DWG 20/51.
2. FOR REINFORCEMENT NOT CALLED OUT, SEE SECTION B 20/55.

SCALE IN FEET
12" 0 5'
SCALE: 1/4" = 1'-0"

SCALE IN FEET
12" 0 5' 10'
SCALE: 3/16" = 1'-0"

US Army Corps of Engineers
Pittsburgh District

LISA K. PIERCE — STATE OF WASHINGTON — 30767 — REGISTERED PROFESSIONAL ENGINEER
EXPIRES: 04/29/

Submitted by: LISA PIERCE, P.E.
Design by: J. ZHANG, P.E.
Drawn by: SL
Checked by: LRP
Submission Date: 2 APR 04
Revision Date: 15 JUN 04
FB NO.: W911WN
Sheet 6 of 8

INCA ENGINEERS INC.
User: brian.mcfarland
Date: 17-JUN-2004 15:07
Plot Scale: 0.166667'=1.000000
Pen Table:
Color Table

Symbol	Description	Date	Appr.
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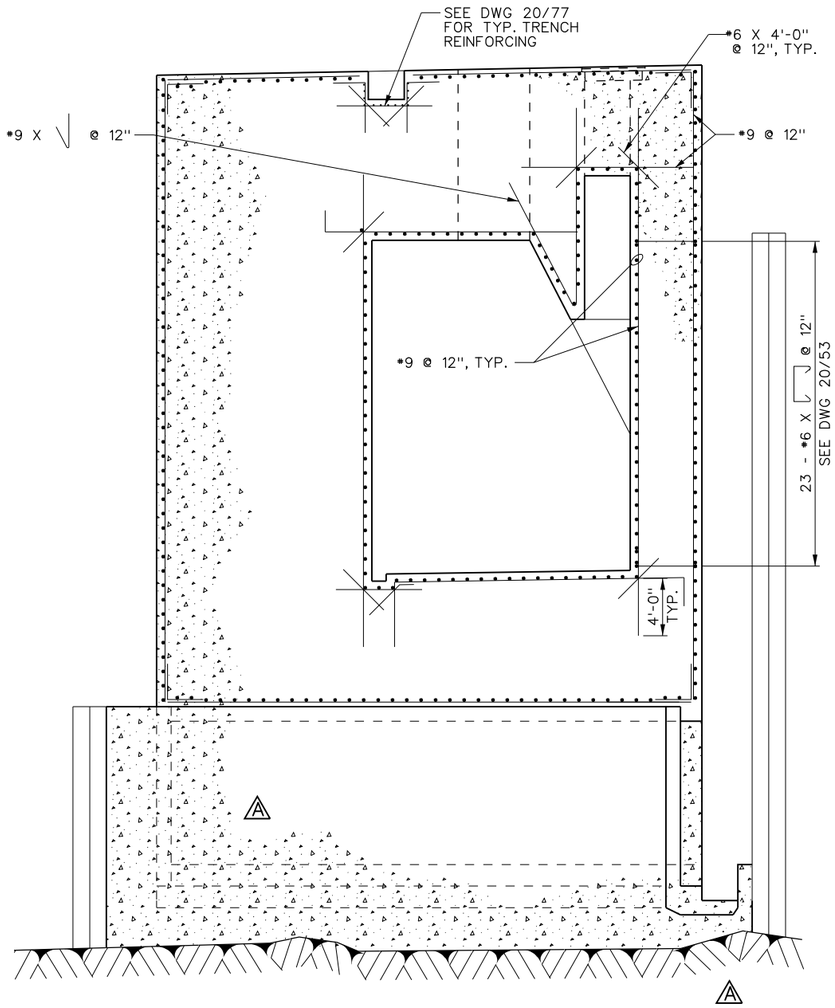
MONONGAHELA RIVER
CHARLEROI LOCKS AND DAM
LOCKS - CONTRACT #1
RIVER WALL
MONOLITHS R-29 AND R-30
REINFORCING DETAILS

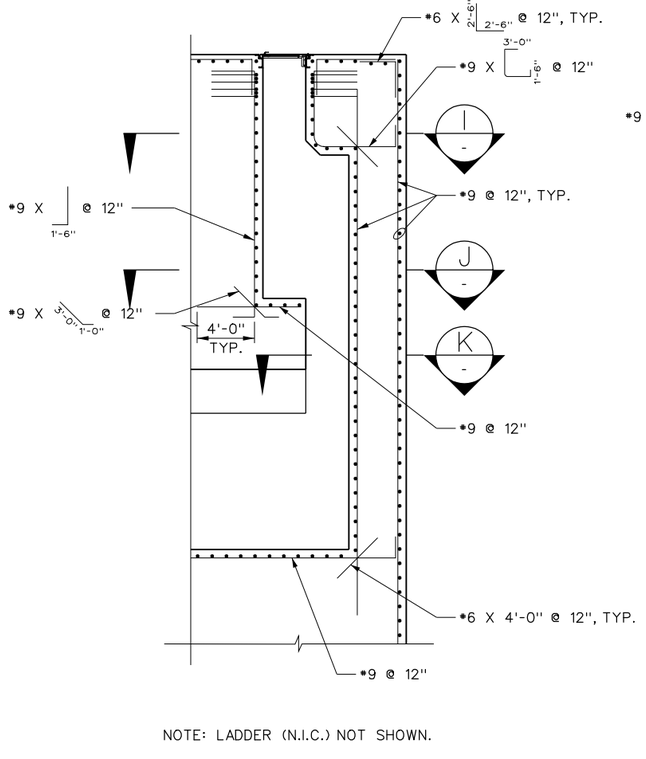
Drawing Number: 037-LCH-20/57.1

This page was intentionally left blank for duplex printing.



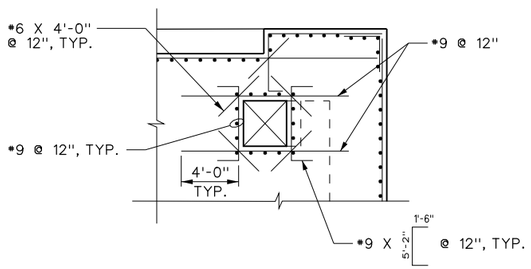
NOTES: WALL ARMOR, CORNER PROTECTION, AND DRILLED SHAFTS NOT SHOWN. FOR REINFORCEMENT NOT CALLED OUT, SEE SECTION E 20/57

REINFORCEMENT SECTION G
SCALE: 3/16" = 1'-0"



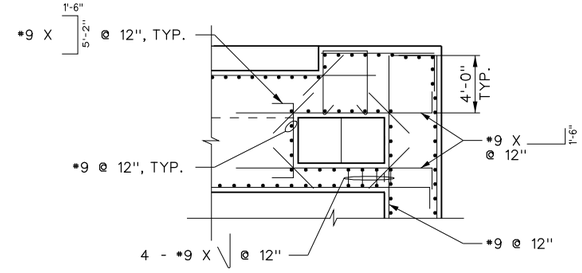
NOTE: LADDER (N.I.C.) NOT SHOWN.

REINFORCEMENT SECTION H
SCALE: 3/16" = 1'-0" — 20/51



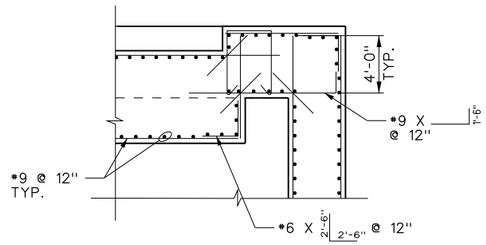
NOTE: LADDER (N.I.C.) NOT SHOWN. FOR REINFORCEMENT NOT CALLED OUT, SEE PLAN ON DWG 20/53

REINFORCEMENT SECTION I
SCALE: 3/16" = 1'-0"



NOTE: LADDER (N.I.C.) NOT SHOWN. FOR REINFORCEMENT NOT CALLED OUT, SEE PLAN ON DWG 20/53

REINFORCEMENT SECTION J
SCALE: 3/16" = 1'-0" — -



NOTE: LADDER (N.I.C.) NOT SHOWN. FOR REINFORCEMENT NOT CALLED OUT, SEE PLAN ON DWG 20/53

REINFORCEMENT SECTION K
SCALE: 3/16" = 1'-0" — -

NOTE:

FOR MONOLITH REINFORCEMENT KEY PLAN SEE DWG 20/51.

SCALE IN FEET
12" 0 5' 10'
SCALE: 3/16" = 1'-0"

US Army Corps of Engineers
Pittsburgh District

STATE OF WASHINGTON — LISA K. PIERCE — 30767 — REGISTERED PROFESSIONAL ENGINEER
EXPIRES: 04/29/

Submitted by: LISA PIERCE, P.E.
PB NO.: W911WN
Sheet 7 of 8

Design by: J. ZHANG P.E.
Dwn by: SL
Ckd by: LRP
Submission Date: 2 APR 04
Revision Date: 15 JUN 04

INCA ENGINEERS INC.
User: brian.mcfarland
Date: 17-JUN-2004 15:08
Plot Scale: 0.166667 ft/000000
Pen Table:
Color Table

Symbol	Description	Date	Appr.
5	DELETE FILLET & ADD CHAMFER - AMEND. NO. 5	17 JUN 04	LRP

F:\M-Chor Lock-C1\sheet\AM5\INCA\20058a-s-5.s01

MONONGAHELA RIVER
CHARLEROI LOCKS AND DAM
LOCKS - CONTRACT #1
RIVER WALL
MONOLITHS R-29 AND R-30
REINFORCING DETAILS

Drawing Number: 037-LCH-20/58.1

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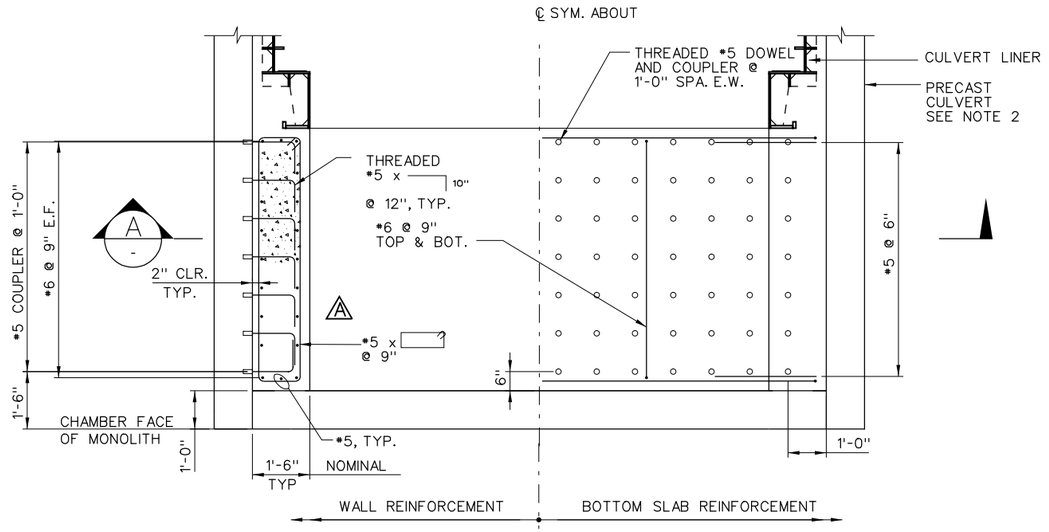
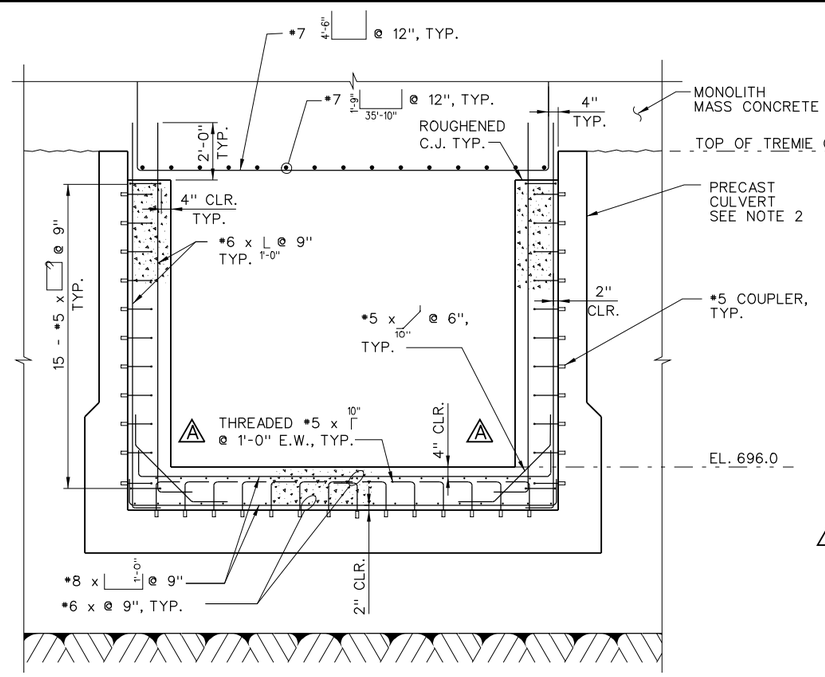
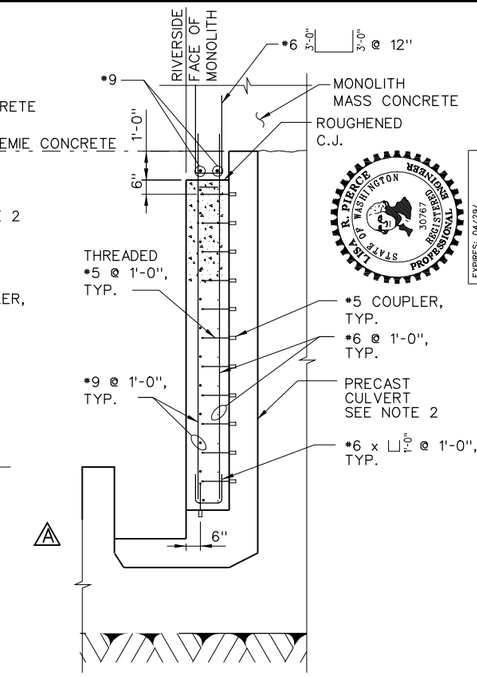


NOTE: WATERSTOP AND REINFORCEMENT IN PRECAST CULVERT NOT SHOWN.



NOTE: TYPICAL REINFORCEMENT FOR MONOLITH AND PRECAST CULVERT NOT SHOWN.

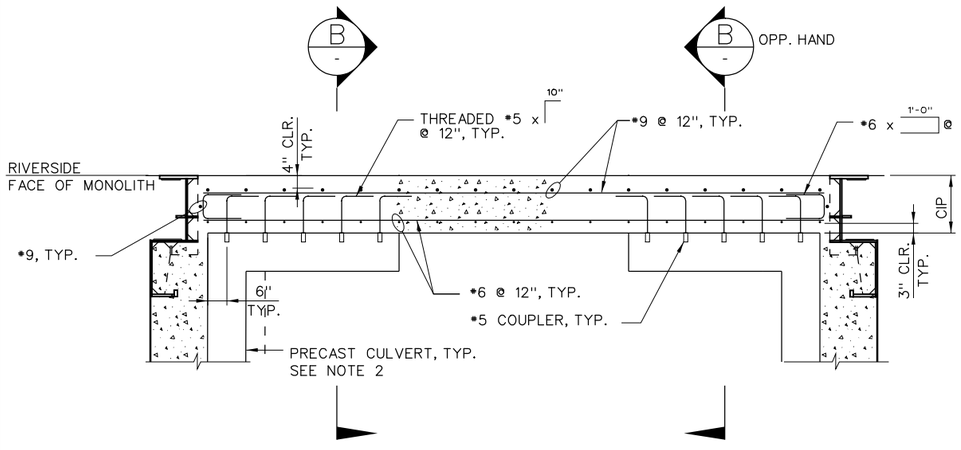


NOTE: TYPICAL REINFORCEMENT FOR MONOLITH AND PRECAST CULVERT NOT SHOWN.

CIP CONC. REINFORCEMENT DETAIL (1)

SCALE: ½" = 1'-0"

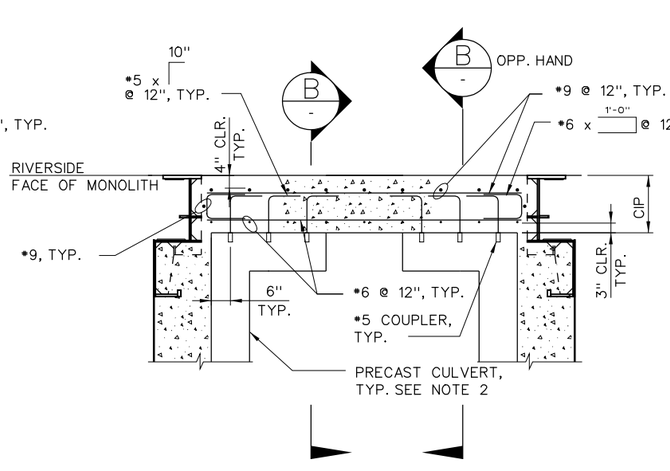
20/51



NOTE: REINFORCEMENT IN PRECAST CULVERT NOT SHOWN.

SECTION (A)

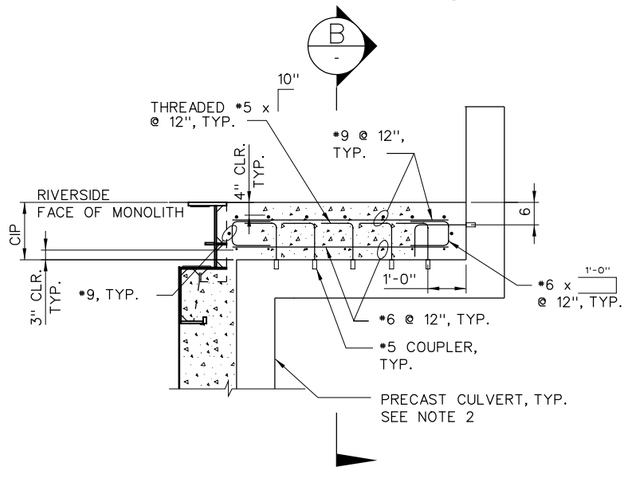
SCALE: ⅜" = 1'-0"



NOTE: REINFORCEMENT IN PRECAST CULVERT NOT SHOWN.

SECTION (B)

SCALE: ⅜" = 1'-0"



NOTE: REINFORCEMENT IN PRECAST CULVERT NOT SHOWN.

CIP CONC. REINFORCEMENT DETAIL (2)

SCALE: ½" = 1'-0"

20/51

CIP CONC. REINFORCEMENT DETAIL (3)

SCALE: ½" = 1'-0"

20/51

CIP CONC. REINFORCEMENT DETAIL (4)

SCALE: ½" = 1'-0"

20/51

NOTES:

1. FOR MONOLITH REINFORCEMENT KEY PLAN SEE DWG 20/51.
2. FOR PRECAST CULVERT REINFORCEMENT SEE DWG 20/48.

SCALE IN FEET
12" 0 1' 2' 3' 4'
SCALE: ½" = 1'-0"

SCALE IN FEET
12" 0 2' 4' 6'
SCALE: ⅜" = 1'-0"

US Army Corps of Engineers
Pittsburgh District

LISA PIERCE, P.E. — STATE OF WASHINGTON — 30767 — REGISTERED PROFESSIONAL ENGINEER — EXPIRES: 04/29/

Submitted by: LISA PIERCE, P.E.
Design by: J. ZHANG, P.E.
Drawn by: TC
Checked by: LRP
Submission Date: 2 APR 04
Revision Date: 15 JUN 04
FFB NO.: W911WN
Sheet 8 of 8

INCA ENGINEERS INC.
User: brian.mcfarland
Date: 17-JUN-2004 15:08
Plot Scale: 0.166667'=1.000000
Pen Table:
Color Table

Symbol	Description	Date	Appr.
1	DELETE FILLET AND ADD CHAMFER - AMEND NO.5 F:\M-Char Lock-C1\sheet\AM5\INCA\20059a-s-5.s01	17 JUN 04	LRP

MONONGAHELA RIVER
CHARLEROI LOCKS AND DAM
LOCKS - CONTRACT #1
RIVER WALL
MONOLITH R-29 AND R-30
REINFORCING DETAILS

Drawing Number: 037-LCH-20/59.1

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NAME		TYPE	COORDINATES	
			NORTH	EAST
R-8	R-8-1	2A	303140.82	1367976.13
	R-8-2	2A	303154.90	1367994.31
	R-8-3	2A	303151.09	1367968.17
	R-8-4	2A	303165.18	1367986.35
	R-8-5	2A	303161.37	1367960.21
	R-8-6	2A	303175.46	1367978.39
R-9	R-9-1	2A	303171.65	1367952.24
	R-9-2	2A	303185.73	1367970.43
	R-9-3	2A	303181.93	1367944.28
	R-9-4	2A	303196.01	1367962.47
R-10	R-10-1	2A	303192.20	1367936.32
	R-10-2	2A	303206.29	1367954.51
	R-10-3	2A	303202.48	1367928.36
	R-10-4	2A	303216.57	1367946.55
	R-10-5	2A	303212.76	1367920.40
	R-10-6	2A	303226.84	1367938.59
R-11	R-11-1	3A	303224.26	1367914.02
	R-11-2	3A	303239.88	1367934.18
	R-11-3	3A	303234.54	1367906.06
	R-11-4	3A	303250.16	1367926.22
	R-11-5	3A	303244.82	1367898.10
	R-11-6	3A	303260.43	1367918.26
	R-11-7	3A	303255.10	1367890.14
	R-11-8	3A	303270.71	1367910.30
R12	R-12-1	3A	303265.37	1367882.18
	R-12-2	3A	303280.99	1367902.34
	R-12-3	3A	303275.65	1367874.22
	R-12-4	3A	303291.27	1367894.38
	R-12-5	3A	303285.93	1367866.26
	R-12-6	3A	303301.54	1367886.42
	R-12-7	3A	303296.21	1367858.30
	R-12-8	3A	303311.82	1367878.46
R-13	R-13-1	2A	303305.63	1367848.48
	R-13-2	2A	303319.71	1367866.66
	R-13-3	2A	303316.63	1367839.95
	R-13-4	2A	303330.71	1367858.14
	R-13-5	2A	303327.63	1367831.43
	R-13-6	2A	303341.71	1267849.62
R-14	R-14-1	2A	303338.63	1367822.91
	R-14-2	2A	303352.72	1367841.09
	R-14-3	2A	303349.63	1367814.39
	R-14-4	2A	303363.72	1367832.57
	R-14-5	2A	303360.64	1367805.87
	R-14-6	2A	303374.72	1367824.05
R-15	R-15-1	2A	303371.64	1367797.34
	R-15-2	2A	303385.72	1367815.53
	R-15-3	2A	303382.64	1367788.82
	R-15-4	2A	303396.73	1367807.01
	R-15-5	2A	303393.64	1367780.30
	R-15-6	2A	303407.73	1367798.48
R-16	R-16-1	2A	303404.65	1367771.78
	R-16-2	2A	303418.73	1367789.96
	R-16-3	2A	303415.65	1367763.26
	R-16-4	2A	303429.73	1367781.44
	R-16-5	2A	303426.65	1367754.74
	R-16-6	2A	303440.74	1367772.92
R-17	R-17-1	2A	303437.65	1367746.21
	R-17-2	2A	303451.74	1367764.40
	R-17-3	2A	303448.66	1367737.69
	R-17-4	2A	303462.74	1367755.88
	R-17-5	2A	303459.66	1367729.17
	R-17-6	2A	303473.74	1367747.35

NAME		TYPE	COORDINATES	
			NORTH	EAST
R-18	R-18-1	2A	303470.66	1367720.65
	R-18-2	2A	303484.75	1367738.83
	R-18-3	2A	303481.66	1367712.13
	R-18-4	2A	303495.75	1367730.31
	R-18-5	2A	303492.67	1367703.60
	R-18-6	2A	303506.75	1367721.79
R-26	R-26-1	2B	303680.76	1367557.92
	R-26-2	2B	303694.84	1367576.10
	R-26-3	2B	303691.76	1367549.40
	R-26-4	2B	303705.85	1367567.58
	R-26-5	2B	303702.76	1367540.88
	R-26-6	2B	303716.85	1367559.06
R-27	R-27-1	2B	303713.77	1367532.35
	R-27-2	2B	303727.85	1367550.54
	R-27-3	2B	303724.77	1367523.83
	R-27-4	2B	303738.85	1367542.02
	R-27-5	2B	303735.77	1367515.31
	R-27-6	2B	303749.85	1367533.49
R-28	R-28-1	2B	303746.77	1367506.79
	R-28-2	2B	303760.86	1367524.97
	R-28-3	2B	303757.78	1367498.27
	R-28-4	2B	303771.86	1367516.45
	R-28-5	2B	303768.78	1367489.75
	R-28-6	2B	303782.86	1367507.93
R-29	R-29-1	3B	303780.41	1367480.74
	R-29-2	3B	303784.69	1367486.28
	R-29-3	3B	303789.13	1367492.01
	R-29-4	3B	303793.57	1367497.74
	R-29-5	3B	303797.86	1367503.27
	R-29-6	3B	303798.99	1367466.35
	R-29-7	3B	303803.27	1367471.89
	R-29-8	3B	303807.71	1367477.62
	R-29-9	3B	303812.15	1367483.35
	R-29-10	3B	303816.44	1367488.88
	R-29-11	3B	303817.56	1367451.96
	R-29-12	3B	303821.85	1367457.50
	R-29-13	3B	303826.29	1367463.23
	R-29-14	3B	303830.73	1367468.96
	R-29-15	3B	303835.02	1367474.49
R-30	R-30-1	3B	303823.10	1367447.67
	R-30-2	3B	303827.38	1367453.21
	R-30-3	3B	303831.82	1367458.94
	R-30-4	3B	303836.26	1367464.67
	R-30-5	3B	303840.55	1367470.21
	R-30-6	3B	303841.68	1367433.28
	R-30-7	3B	303845.96	1367438.82
	R-30-8	3B	303850.40	1367444.55
	R-30-9	3B	303854.84	1367450.28
	R-30-10	3B	303859.13	1367455.82
	R-30-11	3B	303860.26	1367418.89
	R-30-12	3B	303864.54	1367424.43
	R-30-13	3B	303868.98	1367430.16
	R-30-14	3B	303873.42	1367435.89
	R-30-15	3B	303877.71	1367441.43
R-31	R-31-1	3C	303870.37	1367413.59
	R-31-2	3C	303883.54	1367430.58
	R-31-3	3C	303879.66	1367406.39
	R-31-4	3C	303892.83	1367423.39

NAME		TYPE	COORDINATES	
			NORTH	EAST
R-32	R-32-1	3C	303889.94	1367398.43
	R-32-2	3C	303903.11	1367415.43
	R-32-3	3C	303900.22	1367390.47
	R-32-4	3C	303913.38	1367407.47
	R-32-5	3C	303910.50	1367382.51
	R-32-6	3C	303923.66	1367399.51
	R-32-7	3C	303920.77	1367374.55
	R-32-8	3C	303933.94	1367391.55
R-33	R-33-1	2B	303930.19	1367364.73
	R-33-2	2B	303944.27	1367382.91
	R-33-3	2B	303941.19	1367356.20
	R-33-4	2B	303955.28	1367374.39
	R-33-5	2B	303952.20	1367347.68
	R-33-6	2B	303966.28	1367365.87
R-34	R-34-1	2B	303962.83	1367339.44
	R-34-2	2B	303976.92	1367357.63
	R-34-3	2B	303973.11	1367331.48
	R-34-4	2B	303987.20	1367349.66
R-35	R-35-1	2B	303983.75	1367323.24
	R-35-2	2B	303997.84	1367341.42
	R-35-3	2B	303994.76	1367314.72
	R-35-4	2B	304008.84	1367332.90
	R-35-5	2B	304005.76	1367306.20
	R-35-6	2B	304019.84	1367324.38

NOTES:
1. REFER TO DWGS 20/64 AND 20/65 FOR DRILLED SHAFT DETAILS.
2. REFER TO DWG 20/60 FOR DRILLED SHAFT LOCATIONS.

US Army Corps of Engineers
Pittsburgh District

Submitted by: /s/JEANINE HOEY, P.E. SECTION CHIEF
Design by: R. A. ALLWES, P.E.
Dwn by: JET
Ckd by: RAA
Submission Date: 16 JUN 04
Revision Date: X
PB NO.: W911WN
Sheet 1 of 1

User: brian.e.mcfarland
Date: 17-JUN-2004 14:56
Plot Scale: 0.166667'=1.000000
Pen Table:
Color Table

Symbol	Description	Date	Appr.
A	DRILLED SHAFT R-15-16 DATA INSERTED - AMEND. NO. 5	16 JUN 04	RAA

F:\M-Char Lock-C1\sheet\AM5\20061a-S-6.s01

MONONGAHELA RIVER
CHARLEROI LOCKS AND DAM
LOCKS - CONTRACT #1
RIVER WALL
DRILLED SHAFT LOCATION
COORDINATES

Drawing Number:
037-LCH-20/61.1

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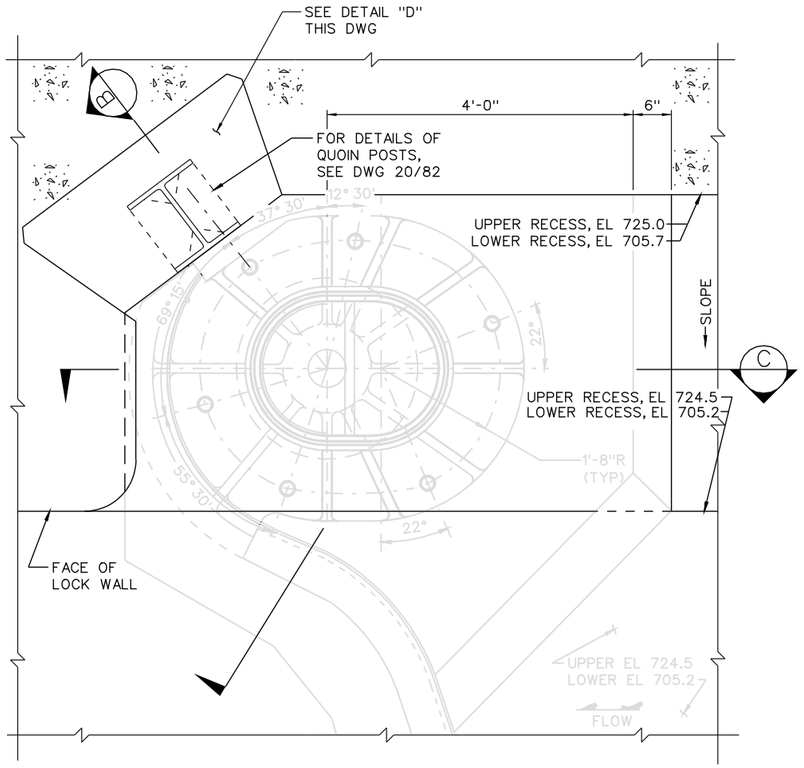
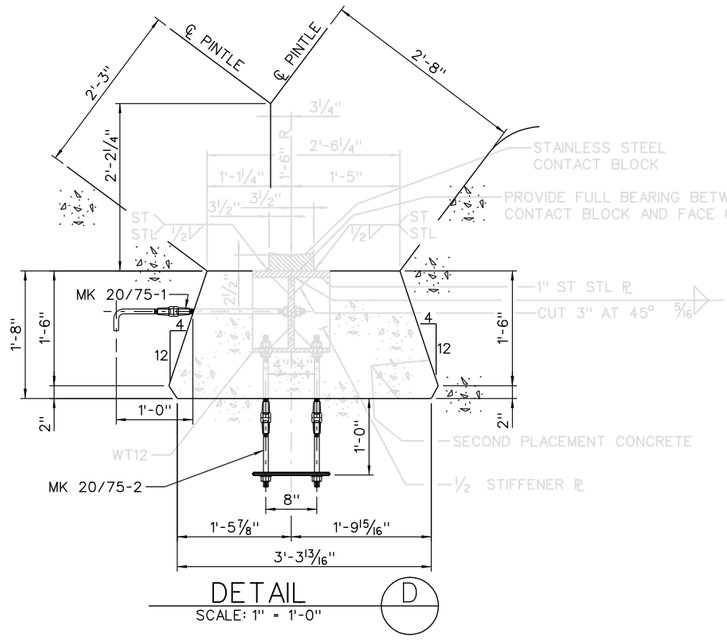
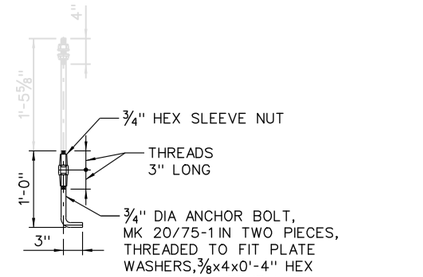


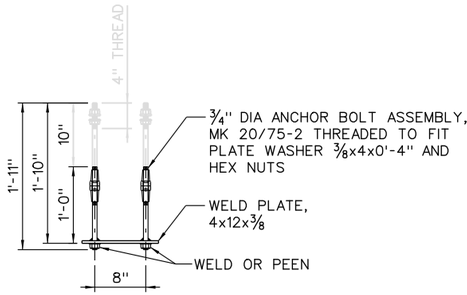
DETAIL A
SCALE: 1" = 1'-0"



DETAIL D
SCALE: 1" = 1'-0"



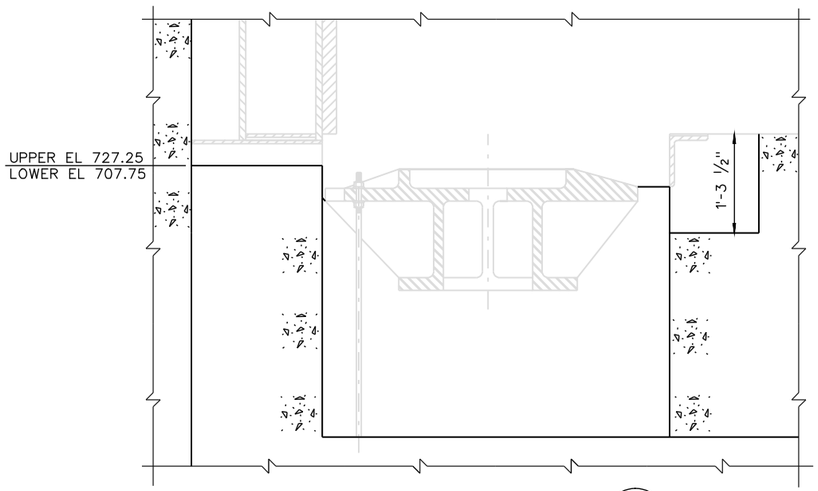
MK 20/75-1



MK 20/75-2

WALL QUOIN ANCHORS

STRUCTURAL STEEL
MK 20/75-1 REQ'D 21 EST WT 3.5 LBS EACH
MK 20/75-2 REQ'D 21 EST WT 9.5 LBS EACH
SCALE: 1" = 1'-0"



SECTION B
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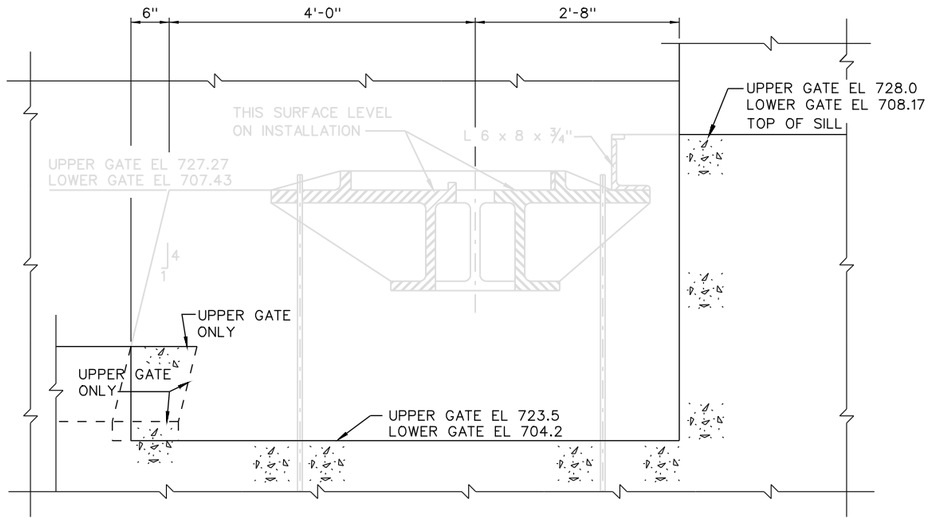

SECTION C
SCALE: 1" = 1'-0"

NOTES:
1. WORK THIS DRAWING WITH DRAWING 20/82.
2. GRAY SHADED ITEMS ARE FUTURE WORK NOT INCLUDED IN THIS CONTRACT.

SCALE: 1" = 1'-0"
12" 0 1' 2'

US Army Corps of Engineers
Pittsburgh District

Submitted by: /s/JEANINE HOEY, P. E. SECTION CHIEF
PFB NO.: W911WN
Sheet 1 of 1
Design by: W. MARTIN, P. E.
Dwn by: JG
Ckd by: WKM
Submission Date: 14 APR 04
Revision Date: 16 JUN 04
User: brian.e.mcfarland
Date: 17-JUN-2004 14:56
Plot Scale: 0.166667'=1.000000
Pen Table:
Color Table

Symbol	Description	Date	Appr.
2	NOTE NO. 2 ADDED BY AMENDMENT NO. 5	17 JUN 04	BEM

F:\M-Char Lock-C1\sheet\AM5\20075-s-5.s01

MONONGAHELA RIVER
CHARLEROI LOCKS AND DAM
LOCKS - CONTRACT #1
UPPER AND LOWER MITER SILL
RECESS AND ANCHOR BOLT LOCATION
DETAIL AND SECTIONS

Drawing Number:
037-LCH-20/75.1

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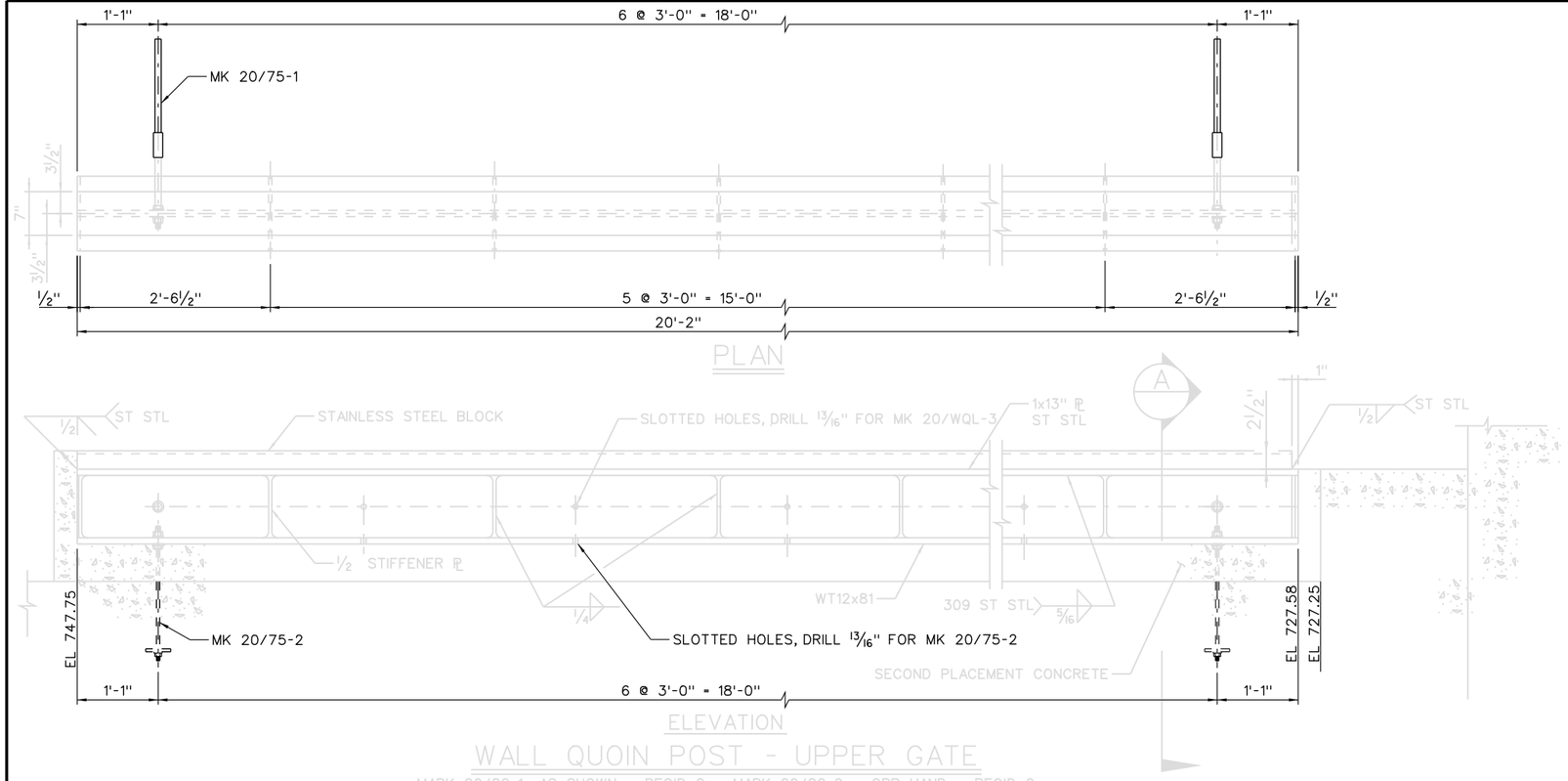

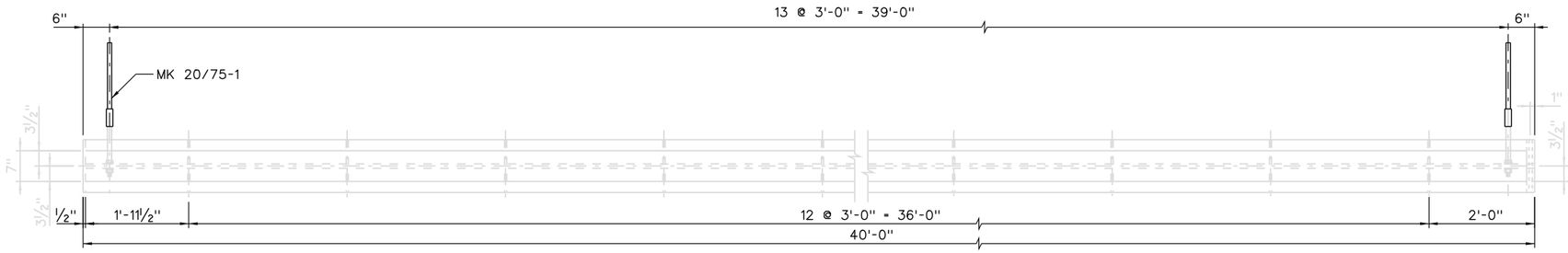

NOTES:
1. WORK THIS DRAWING WITH DRAWING 20/75.
2. GRAY SHADED ITEMS ARE FUTURE WORK NOT INCLUDED IN THIS CONTRACT.

US Army Corps of Engineers
Pittsburgh District

Submitted by: /s/JEANINE HOEY, P. E. SECTION CHIEF
FB NO.: W911WN
Sheet 1 of 1

Design by: W. MARTIN, P. E.
Dwn by: JWF
Ckd by: WKM
Submission Date: 14 APR 04
Revision Date: 16 JUN 04

User: brian.e.mcfarland
Date: 17-JUN-2004 14:56
Plot Scale: 0.166667'=1.000000
Pen Table:
Color Table

Symbol	Description	Date	Appr.
2	NOTE NO. 2 ADDED BY AMENDMENT NO. 5	17 JUN 04	BEW

F:\M-Char Lock-C1\sheet\AM5\20082-s-5.s01

MONONGAHELA RIVER
CHARLEROI LOCKS AND DAM
LOCKS - CONTRACT #1
MISCELLANEOUS METAL
UPPER GATE - WALL QUOIN POSTS
PLANS AND ELEVATIONS

Drawing Number: 037-LCH-20/82.1

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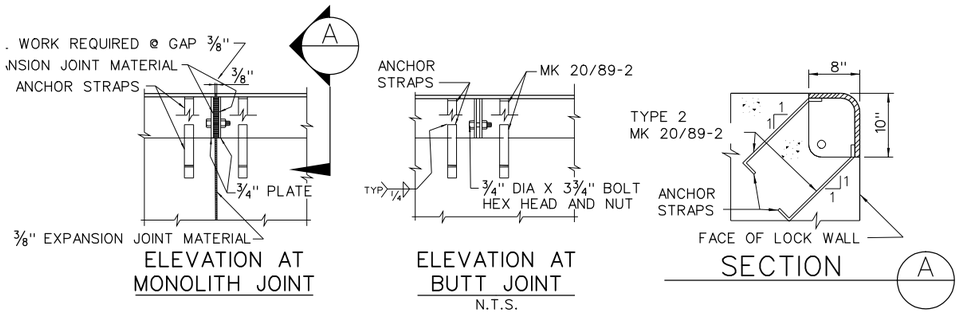
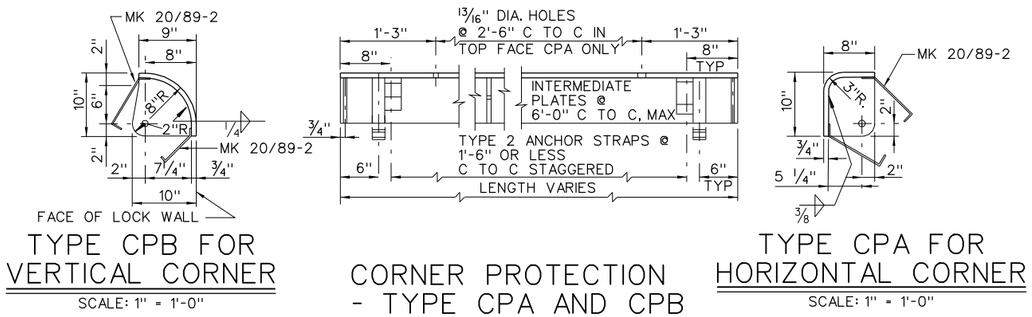
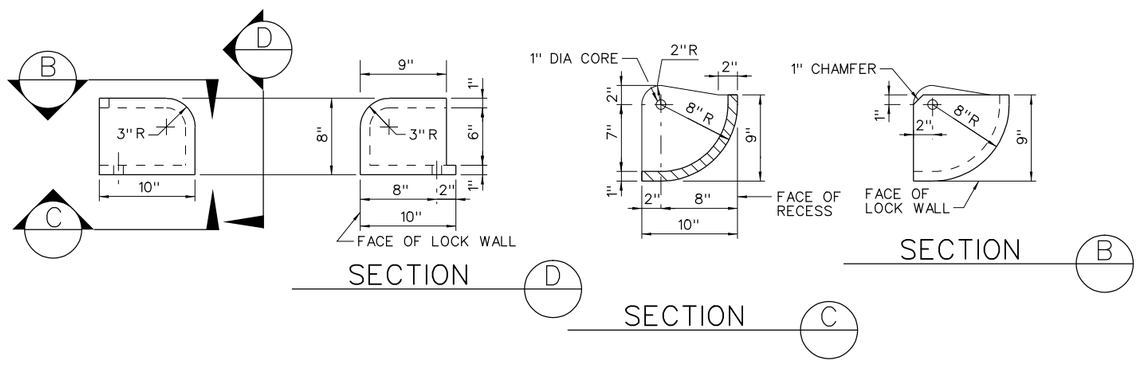


CORNER PROTECTION INSTALLATION

SCALE: 1" = 1'-0"



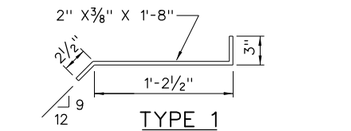
EST WT 36.3LS/IN FT FOR BENT PLATE CPA ONLY RED'Q 170 LIN FT. ⚠
EST WT 38.2LS/LIN FT FOR BENT PLATE CPB ONLY REQ'D 303 LIN FT.

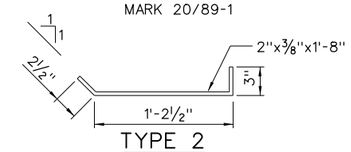


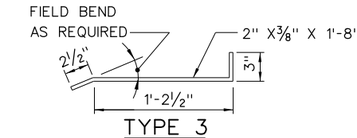
CORNER CASTING

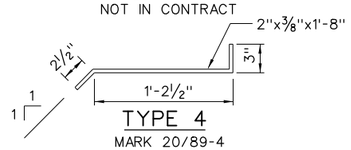
SCALE: 1½" = 1'-0"

CAST STEEL - CLASS 65-35
MARK 20/89-5 (AS SHOWN) REQ'D 5 WT 75 LBS EACH
MARK 20/89-6 (OPP HAND) REQ'D 5 WT 75 LBS EACH
USE PATTERNS No. O-LNC-20/31-3 AND O-LNC-20/31-4



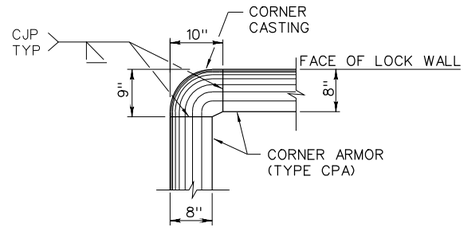






ANCHOR STRAPS

STRUCTURAL STEEL
EST WT 4.26 LBS EACH
SCALE: 1 ½"=1'-0"



ELEVATION

CORNER CAP SPLICES

SCALE: 1" = 1'-0"

NOTES:
1. FOR GENERAL NOTES, SEE DWG. 20/2.
2. INDIVIDUAL LENGTHS OF STRAIGHT HORIZONTAL CORNER PROTECTION AND WALL ARMOR HAVE NOT BEEN DETAILED, SEE LOCK WALL ELEVATION DWGS 20/4 THROUGH 20/10 FOR LOCATIONS AND REQUIRED LENGTHS.
3. ERECTION BOLTS HAVE NOT BEEN DETAILED AND THEIR USE SHALL BE SUBJECT TO THE APPROVAL OF THE CONTRACTING OFFICER.
4. LENGTHS OF WALL ARMOR AND CORNER PROTECTION SHALL NOT CROSS MONOLITH JOINTS.
5. PROVIDE CHAMFERED ENDS ON WALL ARMOR LINE HOOK GUARD, VERTICAL PROTECTION AND ADJACENT UNARMORED WALL SECTIONS.

SCALE: 1" = 1'-0" 12" 0 1' 2'
SCALE: 1½" = 1'-0" 12" 6" 0 1'

US Army Corps of Engineers
Pittsburgh District

Submitted by: /s/ALLEN T. REMALY, P.E. SECTION CHIEF
PFB NO.: W911WN
Sheet 1 of 1

Design by: B. SCHNELLER, P. E.
Dwn by: BLS
Ckd by: TDS
Submission Date: 02 APR 04
Revision Date: 17 JUN 04

User: brian.e.mcfarland
Date: 17-JUN-2004 14:56
Plot Scale: 0.166667 ft/000000
Pen Table:
Color Table

Symbol	Description	Date	Appr.
⚠	UPDATED QUANTITIES - AMENDMENT NO.5 F:\M-Char Lock-C1\sheet\AM5\20089-c-5.s01	17 JUN 04	BEM

MONONGAHELA RIVER
CHARLEROI LOCKS AND DAM
LOCKS - CONTRACT #1
MISCELLANEOUS METAL
WALL ARMOR
DETAILS

Drawing Number: 037-LCH-20/89.1

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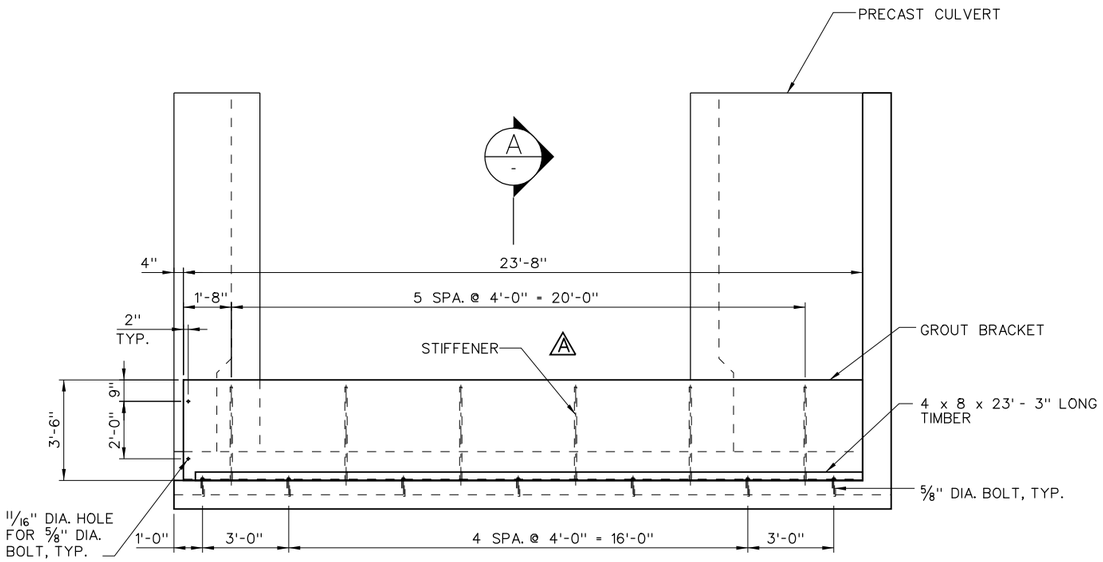
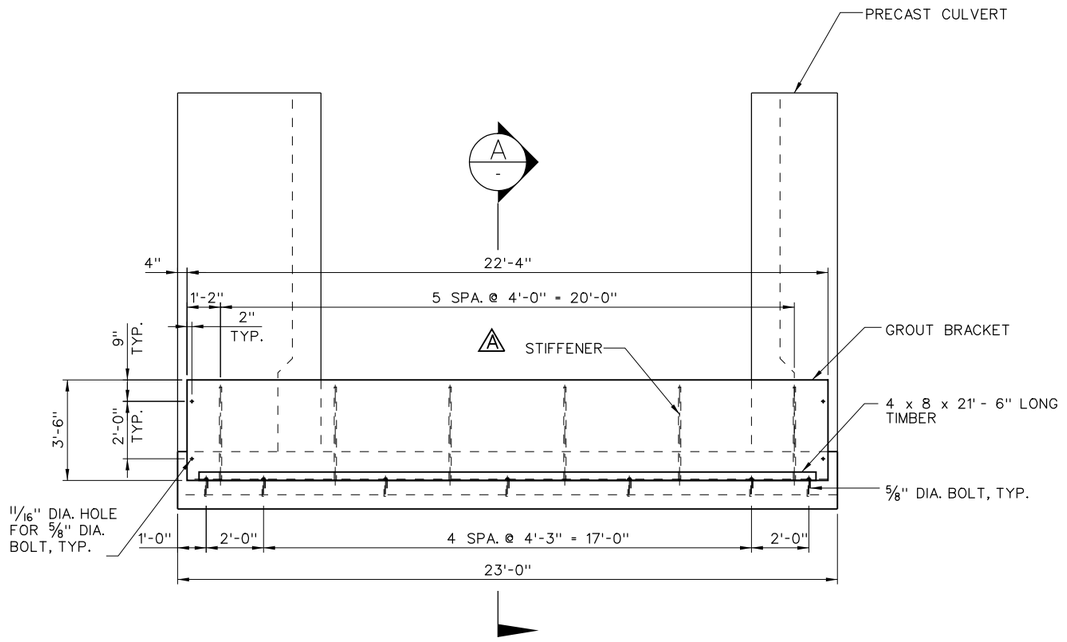


ELEVATION - PRECAST CULVERT TYPE A GROUT BRACKET

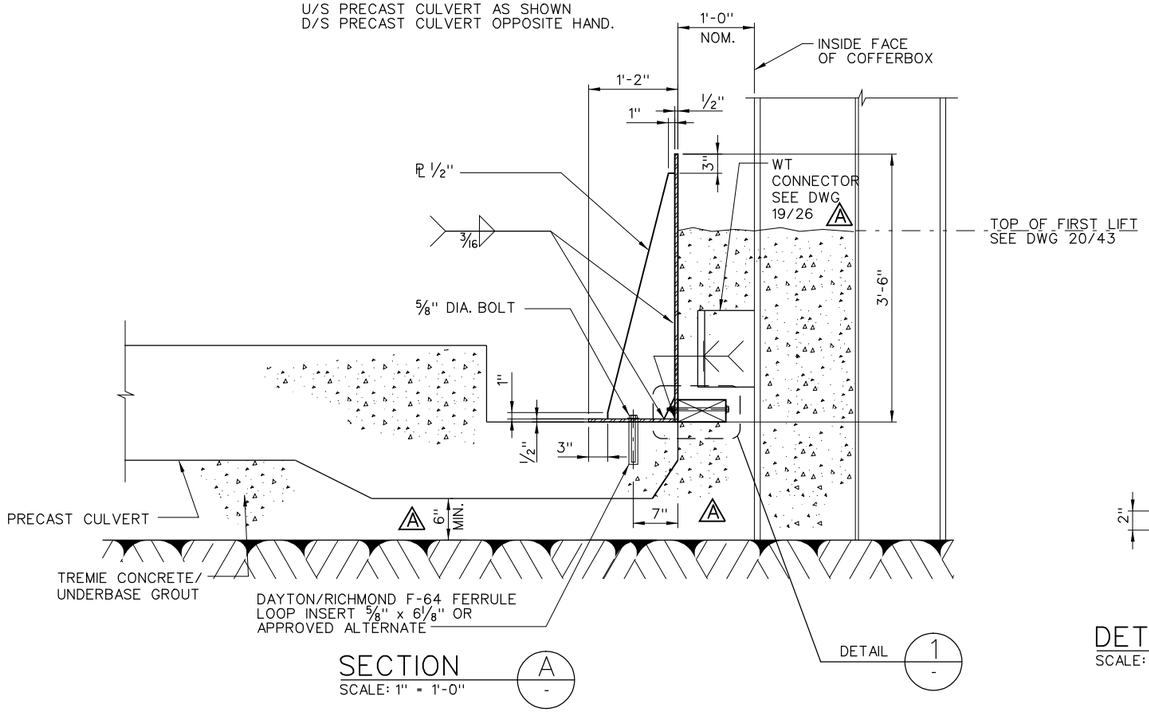
SCALE: 3/8" = 1'-0"



ELEVATION - PRECAST CULVERT TYPE B GROUT BRACKET

SCALE: 3/8" = 1'-0"

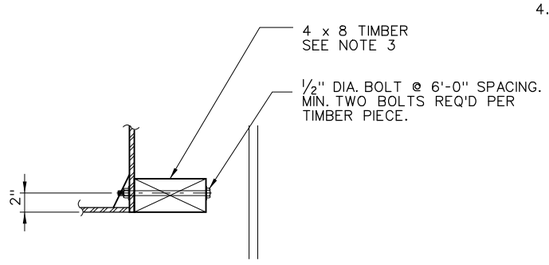
NOTE:
U/S PRECAST CULVERT AS SHOWN
D/S PRECAST CULVERT OPPOSITE HAND.



SECTION A -

SCALE: 1" = 1'-0"

NOTE:
U/S PRECAST CULVERT AS SHOWN
D/S PRECAST CULVERT OPPOSITE HAND.



DETAIL 1 - 1 20/94 1 20/95

SCALE: 1 1/2" = 1'-0"

NOTES:

1. ALL STEEL PLATES SHALL BE ASTM A572 GRADE 50, UNLESS NOTED OTHERWISE.
2. ALL BOLTS SHALL BE ASTM A325, ULESS NOTED OTHERWISE.
3. THIS TIMBER STRIP IS REQUIRED TO FACILITATE FUTURE REMOVAL OF TREMIE CONCRETE IN THIS AREA (TREMIE CONCRETE REMOVAL N.I.C.)
4. REFER TO DWG 20/39 AND DWG 20/40 FOR MONOLITH CONSTRUCTION SEQUENCE.

SCALE IN FEET
12" 0 2' 4' 6'
SCALE: 3/8" = 1'-0"

SCALE IN FEET
12" 6" 0 1'
SCALE: 1" = 1'-0"

SCALE IN FEET
12" 9" 6" 3" 0 1'
SCALE: 1 1/2" = 1'-0"

US Army Corps of Engineers
Pittsburgh District

STATE OF WASHINGTON LISA K. PIERCE 30767 REGISTERED PROFESSIONAL ENGINEER
EXPIRES: 04/29/

Submitted by: LISA PIERCE, P.E.
Design by: J. ZHANG, P.E.
Drwn by: TC
Ckd by: LRP
Submission Date: 2 APR 04
Revision Date: 15 JUN 04
FB NO.: W911WN
Sheet 1 of 3

INCA ENGINEERS INC.
User: brian.mcfarland
Date: 17-JUN-2004 15:08
Plot Scale: 0.166667'=1.000000
Pen Table:
Color Table

Symbol	Description	Date	Appr.
1	MISC. REVISIONS - AMEND. NO. 5	17 JUN 04	MI

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MONONGAHELA RIVER
CHARLEROI LOCKS AND DAM
LOCKS - CONTRACT #1
MISCELLANEOUS METAL
MONOLITHS R-29 AND R-30
TREMIE CLOSURE PLATE DETAILS

Drawing Number: 037-LCH-20/93.1

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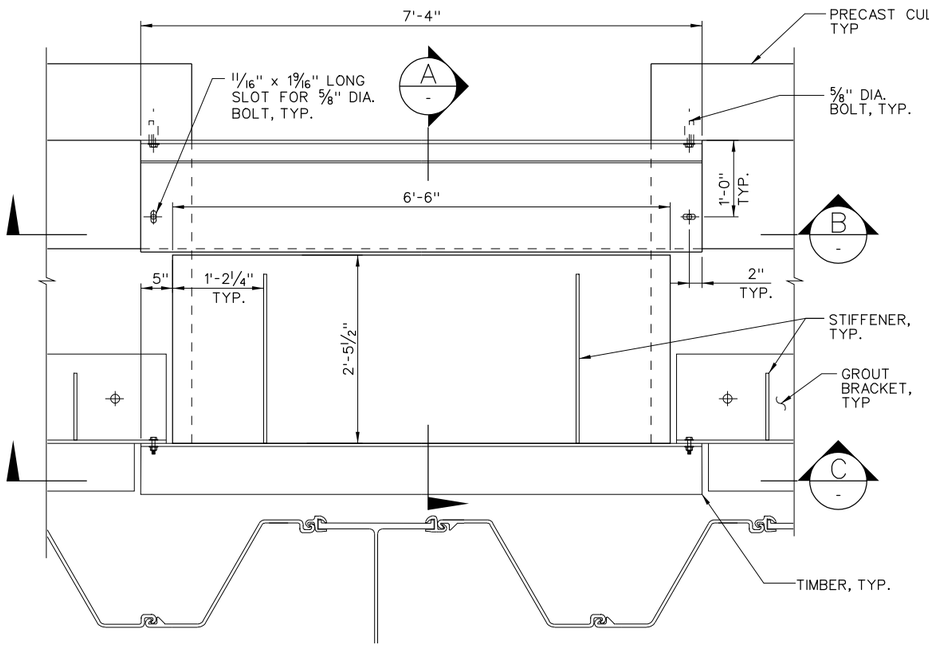
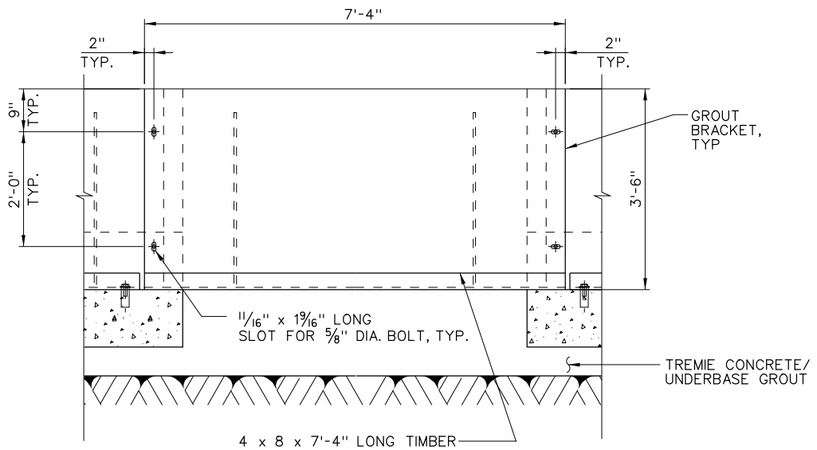


PLAN - TREMIE CLOSURE PLATE TYPE - 1

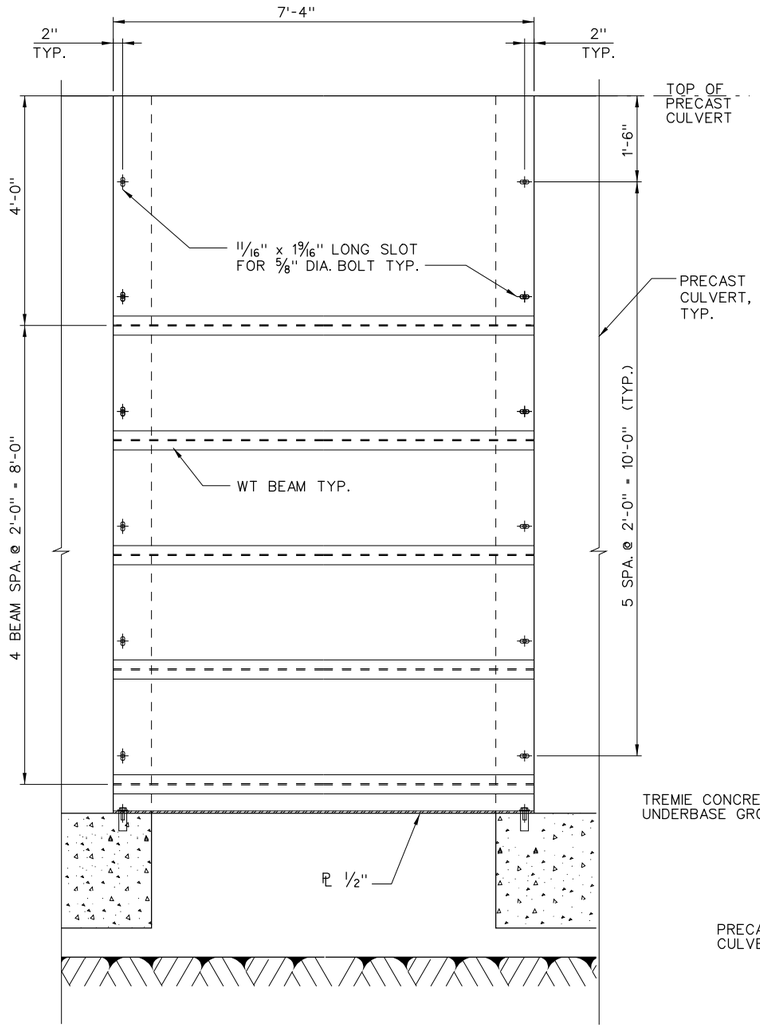
SCALE: 1" = 1'-0"



ELEVATION C

SCALE: 3/4" = 1'-0"

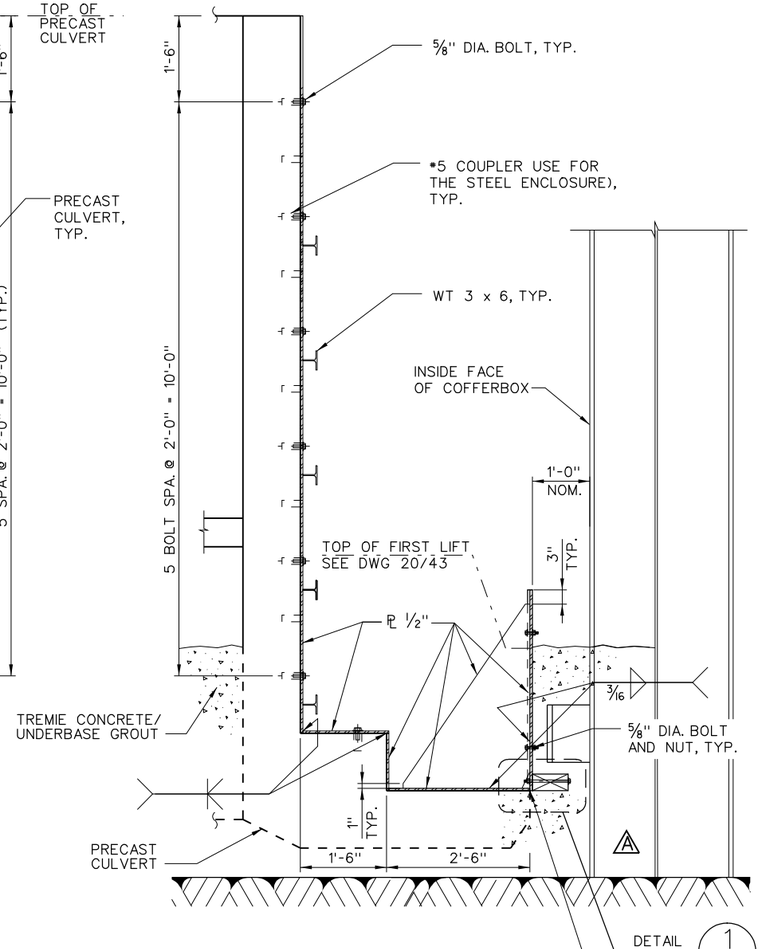
NOTE:
PRECAST CULVERT ABOVE GROUT BRACKET NOT SHOWN FOR CLARITY.



ELEVATION B

SCALE: 3/4" = 1'-0"

NOTE:
PRECAST CULVERT REINFORCEMENT NOT SHOWN FOR CLARITY.



SECTION A

SCALE: 3/4" = 1'-0"

NOTE:
PRECAST CULVERT REINFORCEMENT NOT SHOWN FOR CLARITY.

SCALE IN FEET
12" 6" 0 1'
SCALE: 1" = 1'-0"

SCALE IN FEET
12" 6" 0 1' 2'
SCALE: 3/4" = 1'-0"

NOTES:

1. SEE NOTES 1 AND 2 ON DWG. 20/93.
2. REFER TO DWG. 20/39 AND DWG 20/40 FOR MONOLITH CONSTRUCTION SEQUENCE.

US Army Corps of Engineers
Pittsburgh District

STATE OF WASHINGTON LISA K. PIERCE 30767 REGISTERED PROFESSIONAL ENGINEER
EXPIRES: 04/29/

Submitted by: LISA PIERCE, P.E.
Design by: J. ZHANG, P.E.
Drawn by: TC
Checked by: LRP
Submission Date: 2 APR 04
Revision Date: 15 JUN 04
PB NO.: W911WN
Sheet 2 of 3

INCA ENGINEERS INC.
User: brian.mcfarland
Date: 17-JUN-2004 15:09
Plot Scale: 0.166667'=1.000000
Pen Table:
Color Table

Symbol	Description	Date	Appr.
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MONONGAHELA RIVER
CHARLEROI LOCKS AND DAM
LOCKS - CONTRACT #1
MISCELLANEOUS METAL
MONOLITHS R-29 AND R-30
TREMIE CLOSURE PLATE DETAILS

Drawing Number: 037-LCH-20/94.1

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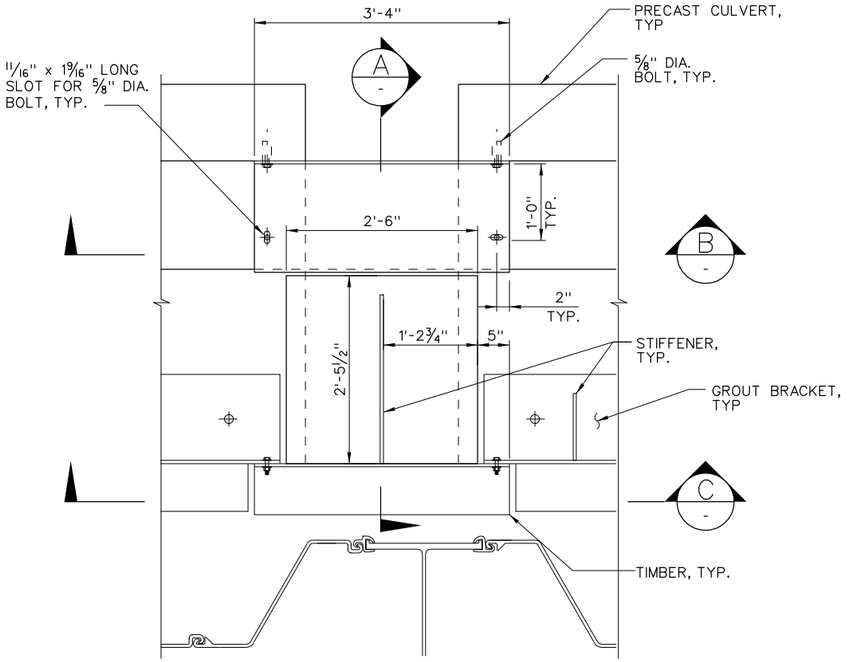
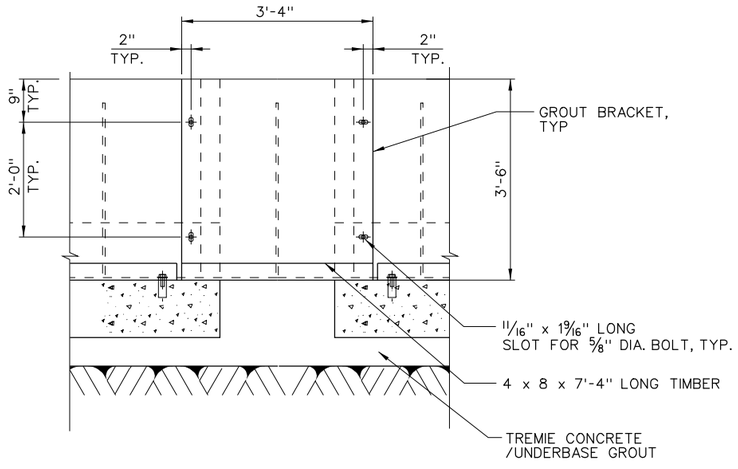


PLAN - TREMIE CLOSURE PLATE TYPE II

SCALE: 1" = 1'-0"

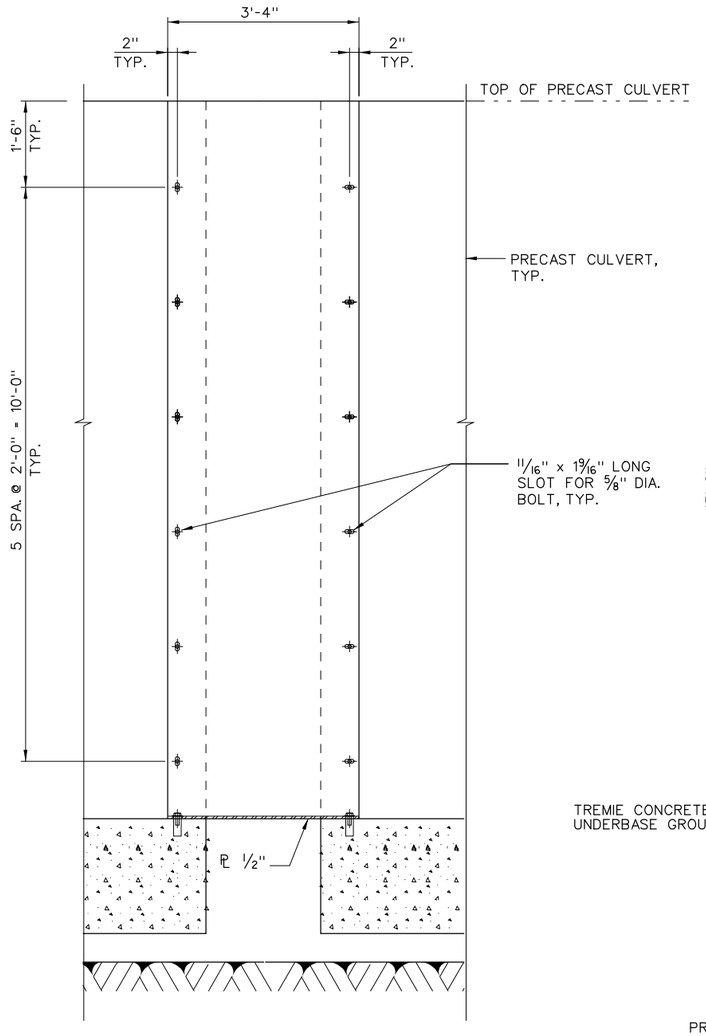


ELEVATION C

SCALE: 3/4" = 1'-0"

NOTE:

PRECAST CULVERT ABOVE GROUT BRACKET NOT SHOWN FOR CLARITY.



ELEVATION B

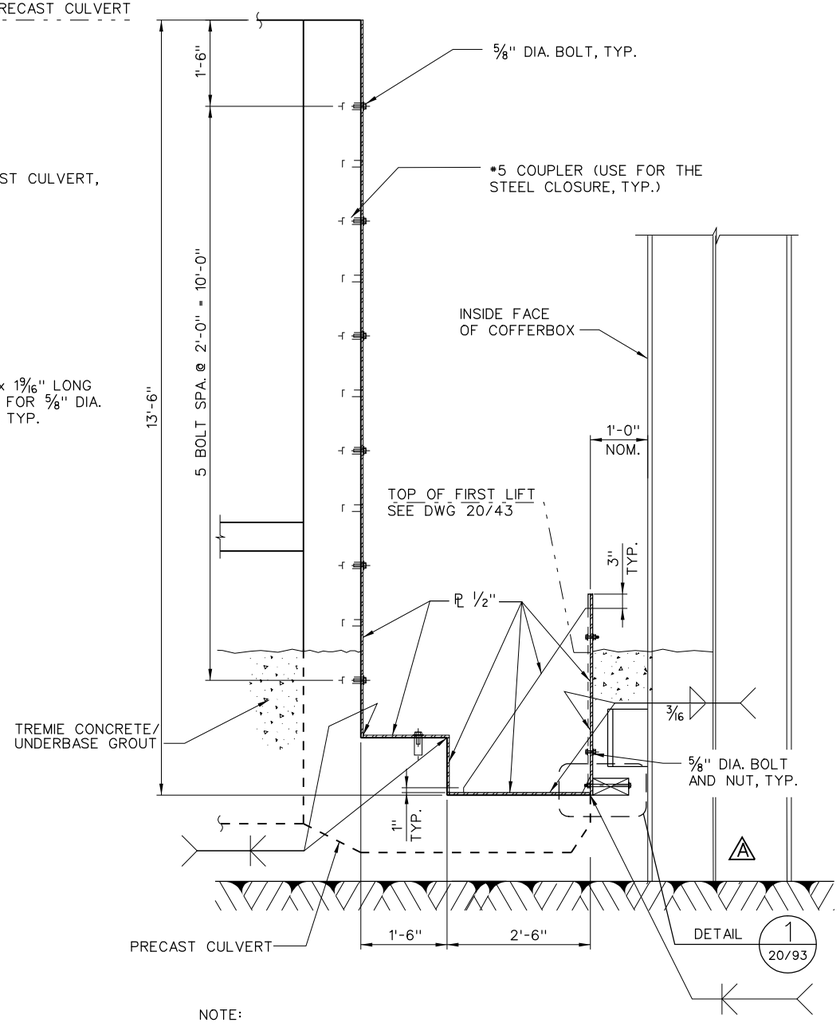
SCALE: 3/4" = 1'-0"

NOTE:

PRECAST CULVERT REINFORCEMENT NOT SHOWN FOR CLARITY.

NOTES:

1. SEE NOTES 1 AND 2 ON DWG. 20/93.
2. REFER TO DWG. 20/39 AND DWG 20/40 FOR MONOLITH CONSTRUCTION SEQUENCE.



NOTE:

PRECAST CULVERT REINFORCEMENT NOT SHOWN FOR CLARITY.

SECTION A

SCALE: 3/4" = 1'-0"

SCALE IN FEET
12" 6" 0 1' 2'
SCALE: 3/4" = 1'-0"

SCALE IN FEET
12" 6" 0 1'
SCALE: 1" = 1'-0"

US Army Corps of Engineers
Pittsburgh District

STATE OF WASHINGTON LISA A. PIERCE 30767 REGISTERED PROFESSIONAL ENGINEER
EXPIRES: 04/29/

Submitted by: LISA PIERCE, P.E.
PB NO.: W911WN
Sheet 3 of 3

Design by: J. ZHANG, P.E.
Drawn by: TC
Chkd by: LRP
Submission Date: 2 APR 04
Revision Date: 15 JUN 04

INCA ENGINEERS INC.
User: brian.e.mcfarland
Date: 17-JUN-2004 15:09
Plot Scale: 0.166667 ft/000000
Pen Table:
Color Table

Symbol	Description	Date	Appr.
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MONONGAHELA RIVER
CHARLEROI LOCKS AND DAM
LOCKS - CONTRACT #1
MISCELLANEOUS METAL
MONOLITHS R-29 AND R-30
TREMIE CLOSURE PLATE DETAILS

Drawing Number: 037-LCH-20/95.1

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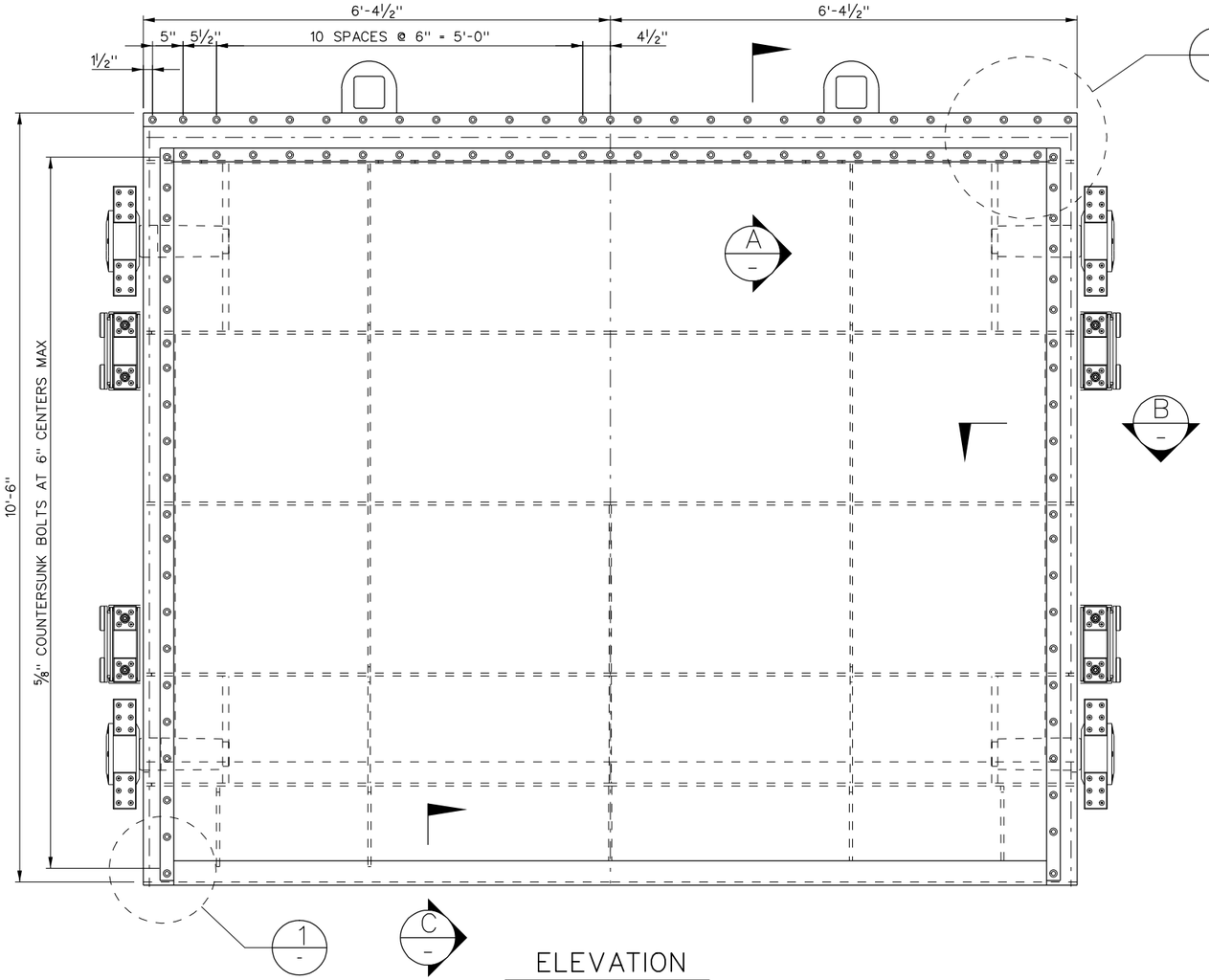
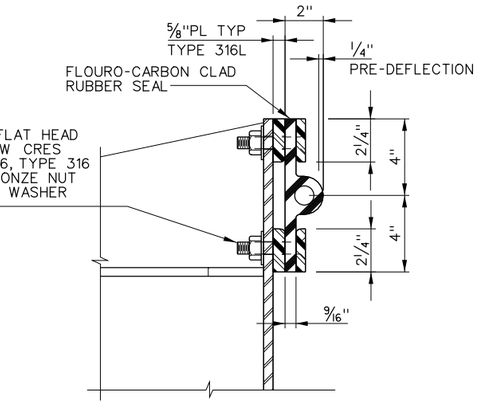


ELEVATION

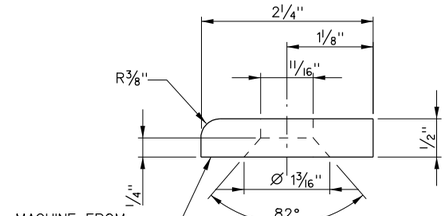
SCALE: 1" =1'-0"

LEAF IS SHOWN WITH SLIDERS
(LIFT LINK OMITTED)



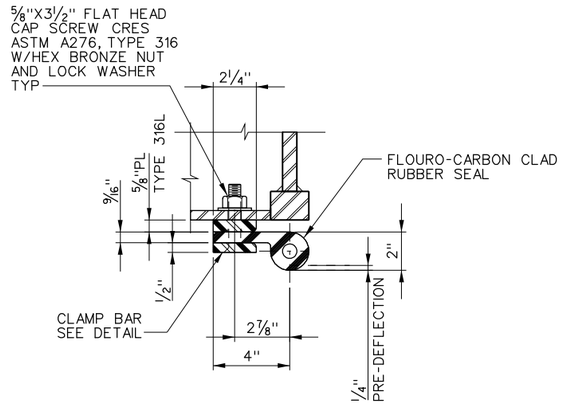
SECTION A

SCALE: 3" = 1'-0"



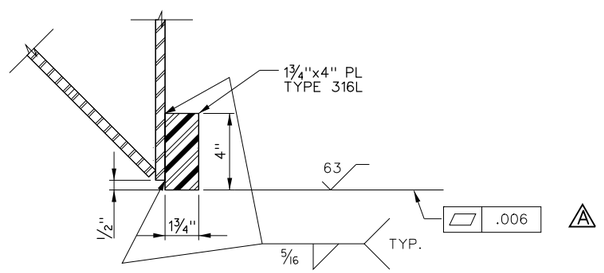
CLAMP BAR DETAIL

SCALE: FULL SIZE



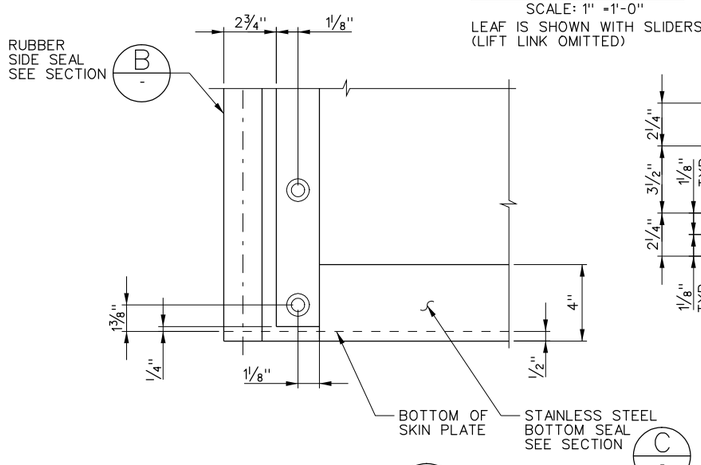
SECTION B

SCALE: 3" = 1'-0"



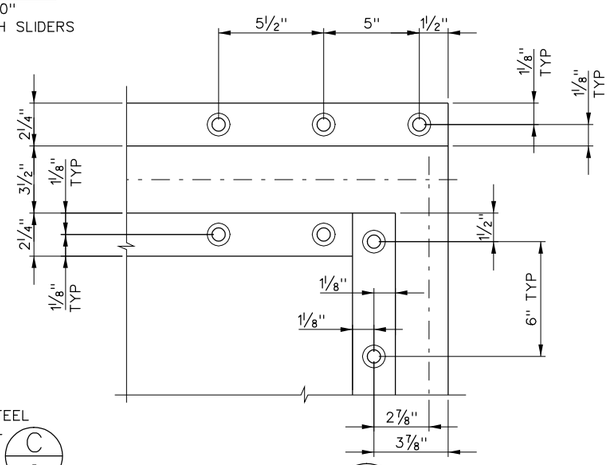
SECTION C

SCALE: 3" = 1'-0"



DETAIL 1

SCALE: 3" = 1'-0"



DETAIL 2

SCALE: 3" = 1'-0"

SCALE IN FEET
12" 6" 0 1'
SCALE: 1" = 1'-0"

SCALE IN INCHES
0 3" 6" 12"
SCALE: 3" = 1'-0"

US Army Corps of Engineers
Pittsburgh District

Submitted by: HASSAN TONDRAVI, P.E.
PB NO.: W911WN

Design by: M. CARNEY, P.E.
Chkd by: HT
Revision Date: 15 JUN 04

Dwn by: KM
Submission Date: 2 APR 04

INCA ENGINEERS INC.

User: brian.mcfarland
Date: 17-JUN-2004 15:09
Plot Scale: 0.166667'=1.000000
Pen Table:
Color Table

Symbol	Description	Date	Appr.
3	REQUIRED FINISH - AMEND. NO. 5	17 JUN 04	JLC

F:\M-Char Lock-C1\sheet\AM5\INCA\24006a-m-5.s01

MONONGAHELA RIVER
CHARLEROI LOCKS AND DAM
LOCKS - CONTRACT #1
CULVERT VALVES, LINERS AND BULKHEADS
EMPTYING VALVE, LEAF, SEALS
AND MISCELLANEOUS DETAILS

Drawing Number:
037-LCH-24/6.1

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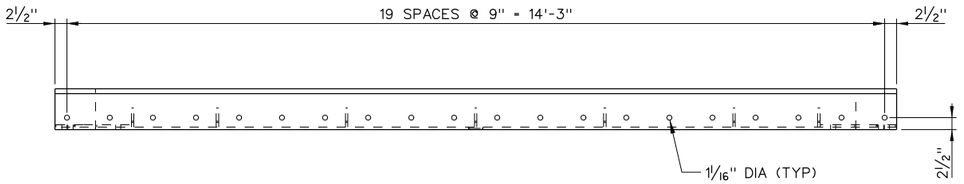
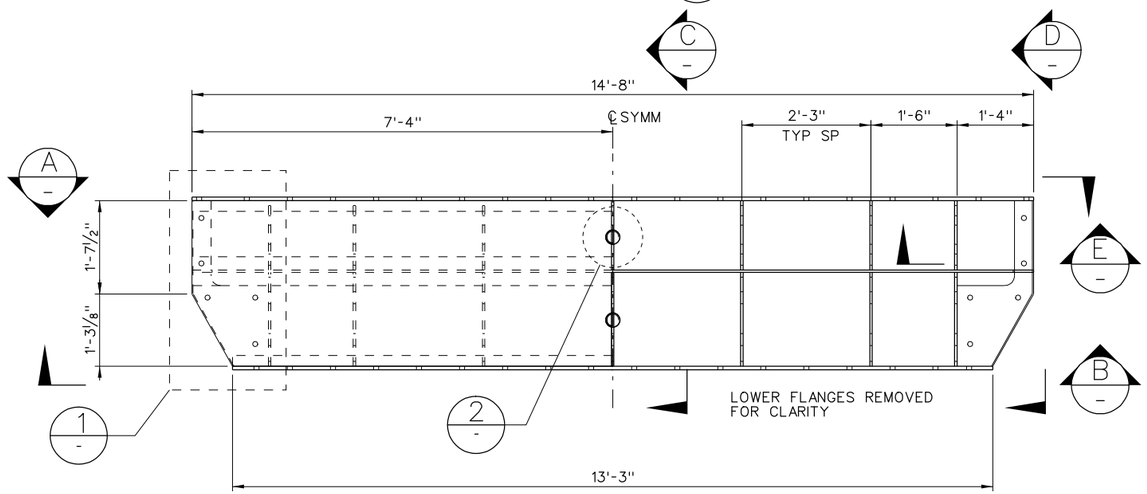
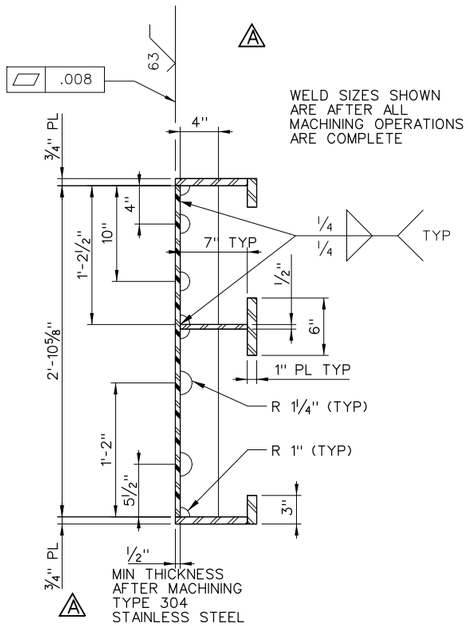


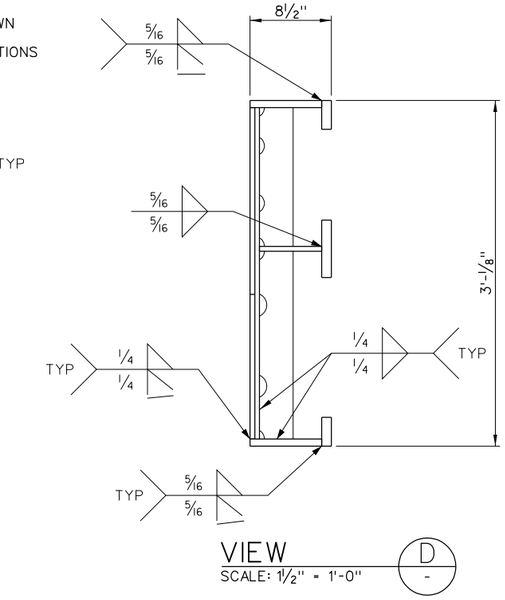
VIEW A
SCALE: 3/4" = 1'-0"



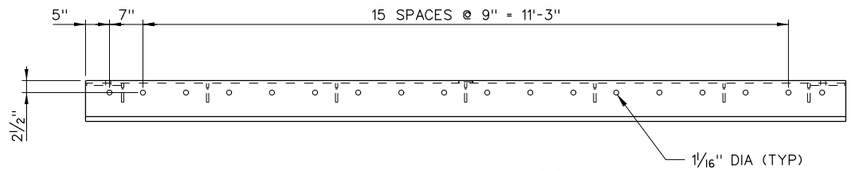
PLAN
SCALE: 3/4" = 1'-0"



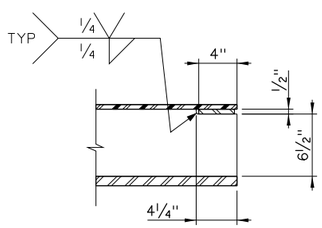
SECTION C
SCALE: 1½" = 1'-0"



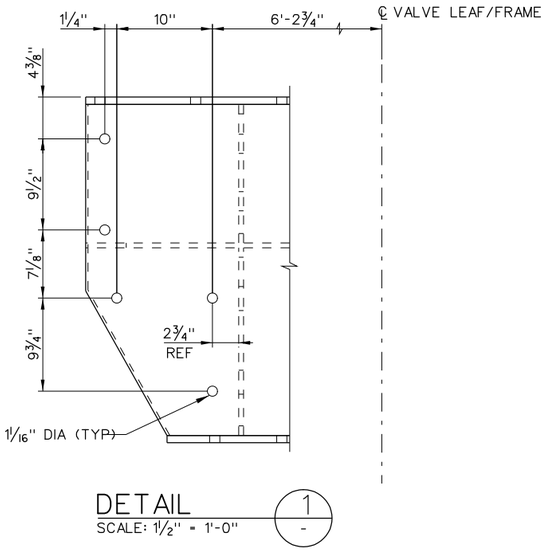
VIEW D
SCALE: 1½" = 1'-0"



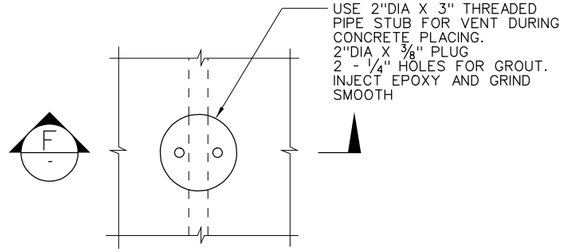
VIEW B
SCALE: 3/4" = 1'-0"



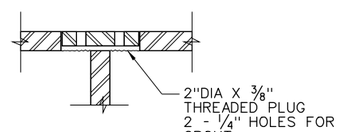
SECTION E
SCALE: 1½" = 1'-0"



DETAIL 1
SCALE: 1½" = 1'-0"



DETAIL 2 (2/24/14)
SCALE: 6" = 1'-0"



SECTION F
SCALE: 6" = 1'-0"

SCALE IN FEET
12" 9" 6" 3" 0 1'
SCALE: 1½" = 1'-0"

SCALE IN INCHES
0 1" 2" 3" 6"
SCALE: 6" = 1'-0"

SCALE IN FEET
12" 6" 0 1' 2'
SCALE: ¾" = 1'-0"

US Army Corps of Engineers
Pittsburgh District

HASSAN TONDRAVI REGISTERED PROFESSIONAL ENGINEER OF ILLINOIS

Submitted by: HASSAN TONDRAVI, P.E.
PB NO.: W911WN
Design by: J. CLOFT, P.E.
Chkd by: HT
Revision Date: 15 JUN 04
Own by: KM
Submission Date: 2 APR 04
INCA ENGINEERS INC.
User: brian.mcfarland
Date: 17-JUN-2004 15:02
Plot Scale: 0.166667'=1.000000
Pen Table:
Color Table

Symbol	Description	Date	Appr.
1	REQUIRED FINISH - AMEND. NO. 5	10 JUN 04	JLC

F:\M-Char Lock-C1\sheet\AMS\INCA\240160-m-5.s01

MONONGAHELA RIVER
CHARLEROI LOCKS AND DAM
LOCKS - CONTRACT #1
CULVERT VALVES, LINERS AND BULKHEADS
EMPTYING VALVE, SILL FRAME
SECTIONS AND DETAILS

Drawing Number: 037-LCH-24/16.1

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LEGEND:

- USACE EASEMENT BOUNDARY
- 800 EXISTING CONTOUR
- EXISTING TREELINE
- A COAL-COVERED SLOPE - REMOVE COAL, REGRADE WITH RIVER SEDIMENT, MULCH, AND SEED WITH STEEP SLOPE (PDT FORMULA C) MIXTURE
- A REMOVE COAL, REPLACE WITH RIVER SEDIMENT, REGRADE AND SEED AREAS WHERE CONSTRUCTION WILL NOT OCCUR WITHIN 20 DAYS (SEE NOTE 2)
- G — G — EXISTING GAS LINE
- E — E — EXISTING ELECTRIC LINE
- TELE — TELE — EXISTING TELEPHONE LINE
- WETLAND
- LIMITS OF DISTURBANCE

NOTES:

1. REMOVE COAL FINES. REGRADE REMOVED COAL WITH RIVER DREDGING SEDIMENTS TO ORIGINAL GRADE. THE MAXIMUM DEPTH OF COAL IS 12 INCHES.
2. ALL WORK SHOWN ON THIS DRAWING AND ON DRAWINGS 103/26 THROUGH 103/28 SHALL BE COMPLETED BEFORE CONSTRUCTING ANY OF THE FEATURES SHOWN ON DRAWING 99/2 THAT ARE WITHIN THE "COAL COVERED AREA" SHOWN ON THIS SHEET. (A)
3. SEED ALL DISTURBED AREAS WITHIN THE WORK AREA THAT WILL BE INACTIVE FOR MORE THAN 20 DAYS.
4. SEE DRAWING 103/26 FOR EROSION AND SEDIMENT CONTROL MEASURES AND SPECIAL NO-DISCHARGE STORMWATER CONTROLS REQUIRED FOR THIS WORK.
5. A HIGH-PRESSURE GAS TRANSMISSION LINE TRAVERSES THE REMEDIATION WORK AREA. THE CONTRACTOR SHALL COORDINATE ALL EXCAVATION ACTIVITY WITH COLUMBIA GAS tRANSMISSION CORP. (A)

E 1,373,500 E 1,374,000 E 1,374,500

N 321,500 N 321,000 N 320,500

MONONGAHELA RIVER FLOW

EXISTING 7' RCP OUTLET MATERIAL, SIZE AND SHAPE VARY (APPROXIMATE LOCATION)

EXISTING 24" DIA. RCP OUTLET (APPROXIMATE LOCATION)

EXISTING DISCHARGE OF SEDIMENT POND

(A) TOTAL AREA OF COAL REMEDIATON AND SEEDING
292,500 SQ. FT.
6.7 ACRES

DISMANTLE EXISTING HOPPER AND CONVEYOR

EXISTING GAS VALVE BOX

SEDIMENT POND

APPROXIMATE LIMITS OF SLOPE TO BE RECLAIMED AND REVEGETATED (AREA = 0.4 ACRE)

APPROXIMATE LIMITS OF AREA TO BE RECLAIMED AND REVEGETATED AS NEEDED (SEE NOTE 3) (AREA = 6.3 ACRES)

2 / 103/28 BANK STABILIZATION

LIMIT OF OFFLOADING PERMIT AREA (10.1 ACRES)

D0400695 △
IRON PIN
N321,259.096 E1,374,295.632
ELEV. 762.4
(REPORTED DESTROYED)

COAL COVERED AREA - SEE NOTES (A)

EASEMENT BOUNDARY

EXISTING BRIDGE (ONE LANE)

N 320,796.66
E 1,373,035.51

N 320,781.67
E 1,373,036.03

N 320,796.24
E 1,373,457.39
EXISTING SECURITY GATE

N 320,769.75
E 1,372,257.00

D0400495 △
BRASS DISK
N320,720.428 E1,372,233.120
ELEV. 763.5

SR 837

EXISTING 8'x4' ARCH CULVERT INLET MATERIAL, SIZE AND SHAPE VARY (APPROXIMATE LOCATION)

EXISTING 24" DIA. RCP INLET

EXISTING 12" DIA. CMP

EXISTING 15" DIA. CMP

USACE EASEMENT BOUNDARY

CALL BEFORE YOU DIG!
CONTACT PENNSYLVANIA ONE CALL SYSTEMS, INC.
3 WORKING DAYS BEFORE CONSTRUCTION
PHONE: 1-800-242-1776

100' 50' 0 100' 200'
SCALE: 1"= 100'

US Army Corps of Engineers
Pittsburgh District

Submitted by: /s/ BRIAN H. GREENE, P.G. SECTION CHIEF
FB NO.: W911WN

Design by: P. DONAHUE, P.E.
Dwn by: PJY
Ckd by: PJD
Submission Date: 2/27/04
Revision Date: X

User: brian.e.mcfarland
Date: 17-JUN-2004 14:56
Plot Scale: 0.166667'=1.000000
Pen Table: Color Table

Symbol	Description	Date	Appr.
A	DEL. LIME-TREAT OPTION; NEW RECLAM. LIMITS; CLARIFY CONS. SEQ. AND SLOPE SEEDING; ADD GAS LINE NOTE. -AMEND. NO. 5	17 JUN 04	BHG

F:\M-Char Lock-C1\sheet\AM5\99001A-b-1.s01

MONONGAHELA RIVER
CHARLEROI LOCKS AND DAM
LOCKS - CONTRACT #1
VICTORY HOLLOW SITE
OFFLOADING AREA RECLAMATION
RECLAMATION PLAN

Drawing Number:
037-LCH-99/1.1

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LEGEND:

- EXISTING CONTOUR (800)
- EXISTING TREELINE
- TRAFFIC FLOW
- PROPOSED GRADE CONTOUR (767)
- PROPOSED CULVERT
- GUIDE RAIL
- SECURITY GATE
- TRAFFIC SIGN (STOP)
- EXISTING GAS LINE (G)
- EXISTING ELECTRIC LINE (E)
- EXISTING TELEPHONE LINE (TELE)

NOTES:

1. SIGNS ARE SCHEMATIC ONLY, FINAL SIGNAGE DESIGN SHALL BE INCLUDED IN THE SITE SAFETY PLAN TO BE SUBMITTED BY THE CONTRACTOR.
2. ALL DOCK REPAIRS AND IMPROVEMENTS SHALL BE FURNISHED BY THE CONTRACTOR.
3. THE LOW-LEVEL DOCK AND MOORING CELLS SHOWN ARE TO BE DESIGNED AND CONSTRUCTED AT THE CONTRACTORS OPTION AND EXPENSE, IF REQD.FOR OFLOADING DREDGED MATERIALS USING FRONT-END LOADERS.
4. CONTRACTOR SHALL DESIGN AND FURNISH GUIDE RAILS SUITABLE FOR THE ANTICIPATED HAULING EQUIPMENT IN ACCORDANCE WITH DM 385-1-1.
5. CONTRACTOR SHALL DESIGN AND FURNISH A CONSTRUCTION ENTRANCE SIGN, COMPLYING WITH PENNDOT STANDARDS. CONSRACTOR SHALL OBTAIN ALL PENNDOT PERMITS AND APPROVALS FOR SIGNAGE WITHIN THE SR 837 RIGHT-OF-WAY.
6. HAUL ROAD "C" SHALL BE COMPLETED ONLY FROM STA. 0+00 TO TO 6+00. THE FUTURE ROAD ALIGNMENT FROM STA. 6+00 TO 11+29.23 SHALL BE CONSTRUCTED TO FINISHED GRADE WITH COMPACTED SOIL FILL, MULCHED AND SEEDED PER SHEET 103/33.
7. THE LAY-DOWN AREA SHOWN SHALL BE RESTRICTED TO SOLID, INERT CONSTRUCTION MATERIALS. LIQUIDS, STOCKPILED AGGREGATES, SOILS OR WASTE ARE PROHIBITED. THE EXISTING VEGETATIVE COVER MUST REMAIN IN-PLACE FOR DURATION OF THE CONTRACT.
8. SEE DRAWING 103/29 - EROSION AND SEDIMENT CONTROL PLAN FOR CONSTRUCTION OF ALL DRAINAGE FEATURES.
9. THE CONTRACTOR SHALL STRICTLY COORDINATE ANY CONSTRUCTION OVER OR WITHIN 25 FEET OF THE EXISTING GAS PIPELINE WITH THE COLUMBIA GAS TRANSMISSION CORP. (A)

HAUL ROAD 'A' CURVE DATA

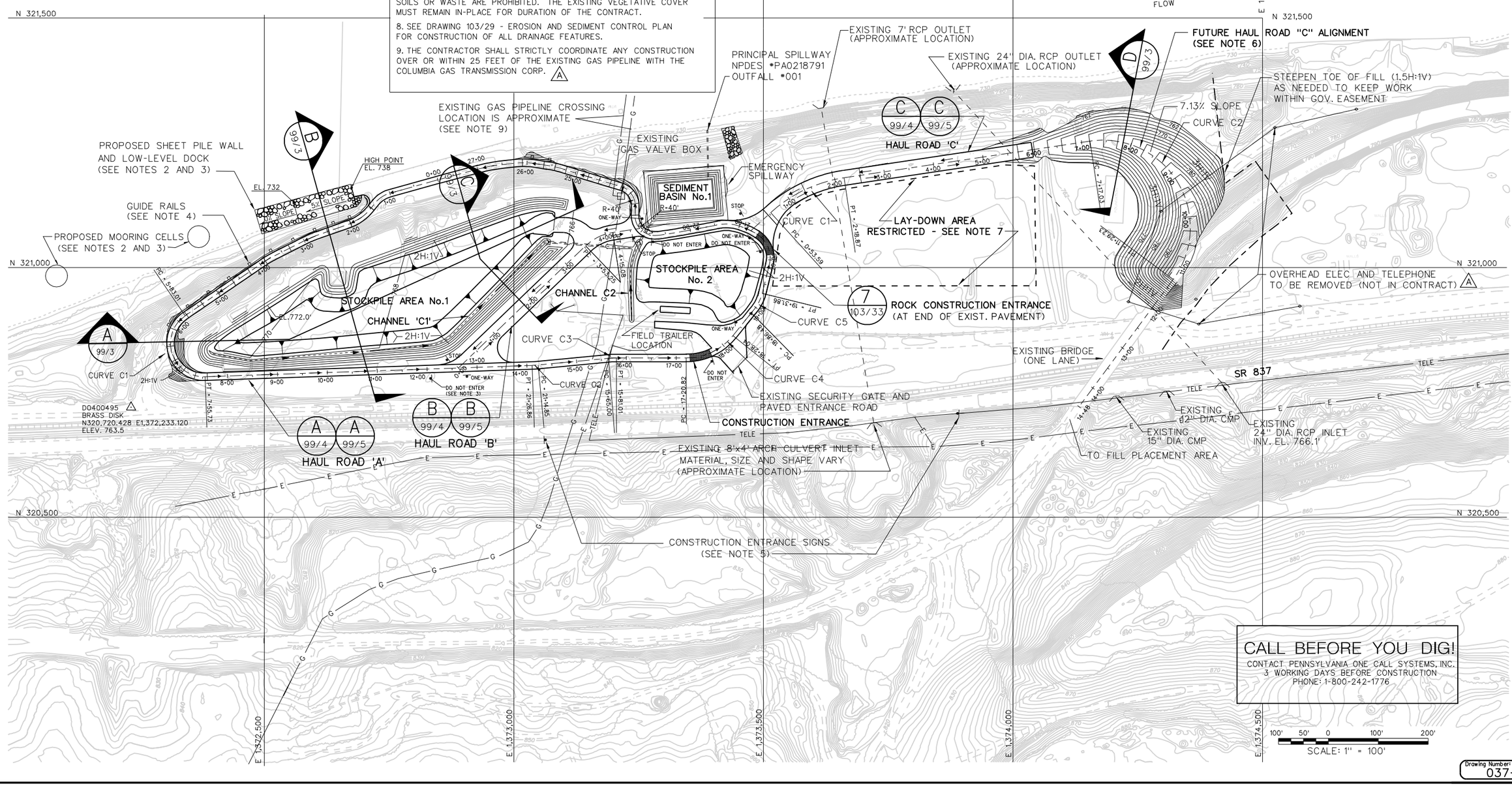
CURVE	RADIUS	ARC LENGTH	CHORD LENGTH	CHORD BEARING	DELTA ANGLE
C1	67.00'	172.72'	128.71'	S 18° 07'45" E	147° 42'06"
C2	200.00'	12.01'	12.01'	N 86° 18'00" E	03° 26'24"
C3	200.00'	16.02'	16.01'	N 87° 41'14" E	04° 35'17"
C4	120.00'	107.22'	103.69'	N 64° 23' E	51° 11'34"
C5	82.24'	45.38'	44.80'	N 29° 34' E	31° 36'46"

HAUL ROAD 'C' CURVE DATA

CURVE	RADIUS	ARC LENGTH	CHORD LENGTH	CHORD BEARING	DELTA ANGLE
C1	280.00'	165.29'	162.90'	N 64° 36' E	33° 49'19"
C2	175.00'	412.20'	323.31'	S 31° 01' E	134° 57'21"

HAUL ROAD SURVEY DATA

	STATION	NORTHING	EASTING
HAUL ROAD A	0+00	321,175.96	1,372,848.00
HAUL ROAD B	0+00	320,799.10	1,372,889.05
HAUL ROAD C	0+00	321,074.04	1,373,475.08



CALL BEFORE YOU DIG!

CONTACT PENNSYLVANIA ONE CALL SYSTEMS, INC.
3 WORKING DAYS BEFORE CONSTRUCTION
PHONE: 1-800-242-1776

US Army Corps of Engineers
Pittsburgh District

Submitted by: /s/ BRIAN H. GREENE, P.G. SECTION CHIEF
FB NO.: W911WN
Design by: P. DONAHUE, P.E.
Drawn by: PJY
Checked by: PJD
Submission Date: 2/27/04
Revision Date: X
User: brian.e.mcfarland
Date: 17-JUN-2004 14:56
Plot Scale= 0.166667in/1.000000
Pen Table: Color Table

Symbol	Description	Date	Appr.
4	ADD GAS LINE NOTE/ ADD ELEC LINE NOTE, SHORTEN CULVERT #1 - AMEND NO. 5	17 JUN 04	BHG

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MONONGAHELA RIVER
CHARLEROI LOCKS AND DAM
LOCKS - CONTRACT #1
VICTORY HOLLOW SITE
OFFLOADING AREA
SITE DEVELOPMENT PLAN

Drawing Number: 037-LCH-99/2.1

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LEGEND:

- 750 — EXISTING CONTOUR
- G — G — EXISTING GAS LINE
- E — E — EXISTING ELECTRIC LINE
- TELE — TELE — EXISTING TELEPHONE LINE
- EXISTING POOL ELEV. 726.9
- FUTURE POOL ELEV. 723.7

NOTES:

1. ONLY THE PHASE 1 DREDGING SHALL BE PERFORMED IN THIS CONTRACT.
2. ADDITIONAL DREDGING AT THE OPTIONAL MOORING CELLS SHALL BE FURNISHED BY THE CONTRACTOR. THIS ADDITIONAL DREDGING IS NOT SHOWN.
3. THE CONTRACTOR SHALL STRICTLY COORDINATE ALL DREDGING WITH THE COLUMBIA GAS TRANSMISSION CORP. (A)
4. THE GAS LINES AND UPSTRAM DREDGING LIMITS SHOWN ARE APPROXIMATE. THE CONTRACTOR SHALL ADJUST THE DREDGING LIMITS TO MAINTAIN SAFE HORIZONTAL CLEARANCES SPECIFIED BY COLUMBIA GAS. (A)

N 322,000

N 321,000

E 1,372,000

E 1,373,000

E 1,374,000

MONONGAHELA RIVER

FLOW

10" GAS TRANSMISSION PIPELINE CROSSING (SEE NOTES 3 AND 4)

CONTROL BASELINE

FUTURE PHASE 2 DREDGING TO ELEV 712.7 AND EDGE OF NEW NAVIGATION CHANNEL NOT IN THIS CONTRACT

PHASE 1 DREDGING TO ELEVATION 715.9

EXISTING MOORING DOLPHINS

LOADING DOCK

OPTIONAL MOORING CELLS

C 99/7

D 99/7

E 99/7

F 99/7

G 99/7

STA. 0+00 - D/S EDGE RIVER FACE EXISTING DOCK

STA. 1+00B

STA. 2+00B

STA. 3+00B

STA. 4+00B

STA. 5+00B

STA. 6+00B

STA. 1+00A

STA. 2+00A

STA. 3+00A

STA. 4+00A

STA. 5+00A

STA. 6+00A

STA. 7+00A

STA. 8+00A

MILE 34

CALL BEFORE YOU DIG!

CONTACT PENNSYLVANIA ONE CALL SYSTEMS, INC.
3 WORKING DAYS BEFORE CONSTRUCTION
PHONE: 1-800-242-1776

100' 50' 0 100' 200'

SCALE: 1" = 100'

US Army Corps of Engineers
Pittsburgh District

Submitted by: /s/ BRIAN H. GREENE, P.G. SECTION CHIEF
FB NO.: W911WN

Design by: P. DONAHUE, P.E.
Dwn by: PJY
Ckd by: PJD
Submission Date: 2/27/04
Revision Date: X

User: brian.e.mcfarland
Date: 17-JUN-2004 14:57
Plot Scale: 0.166667 ft/000000
Pen Table: Color Table

Symbol	Description	Date	Appr.
(A)	REV. DREDGE LIMITS DUE TO GAS LINE - AMEND. NO. 5	17 JUN 04	BHG

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MONONGAHELA RIVER
CHARLEROI LOCKS AND DAM
LOCKS - CONTRACT #1
VICTORY HOLLOW SITE
DOCK DREDGING
DREDGING PLAN

Drawing Number: 037-LCH-99/6.1

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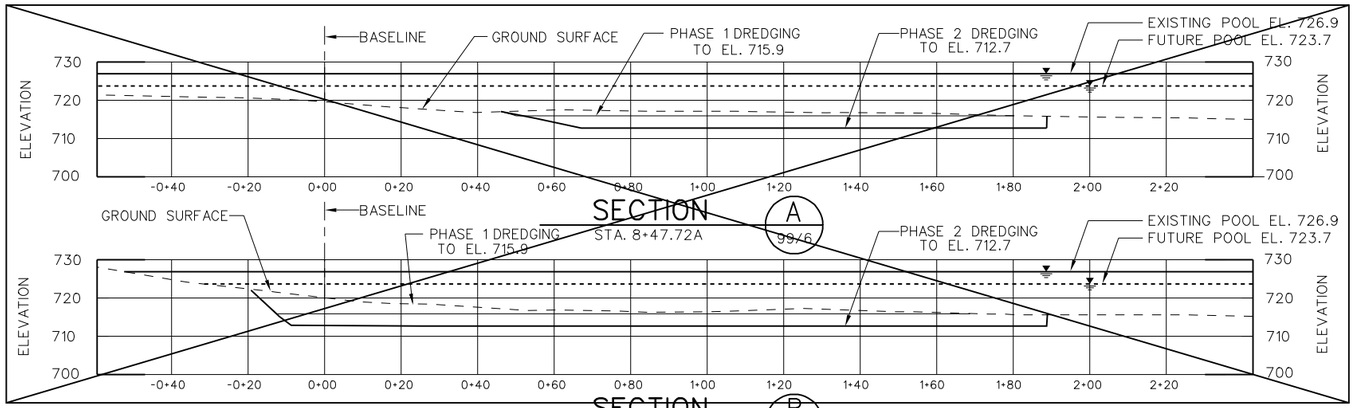

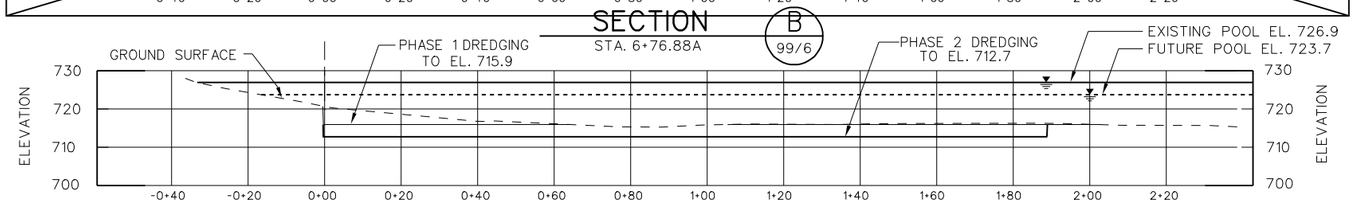

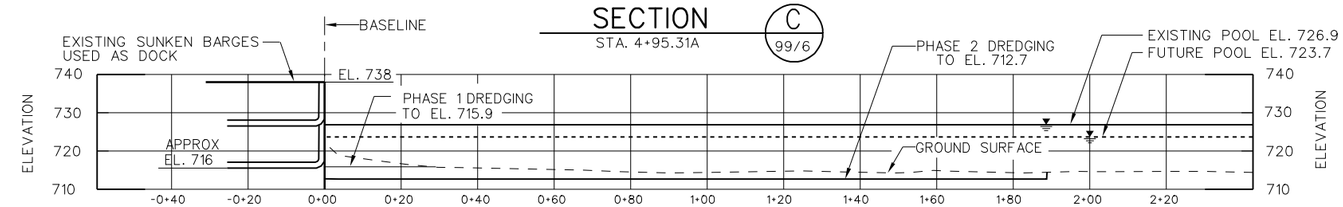

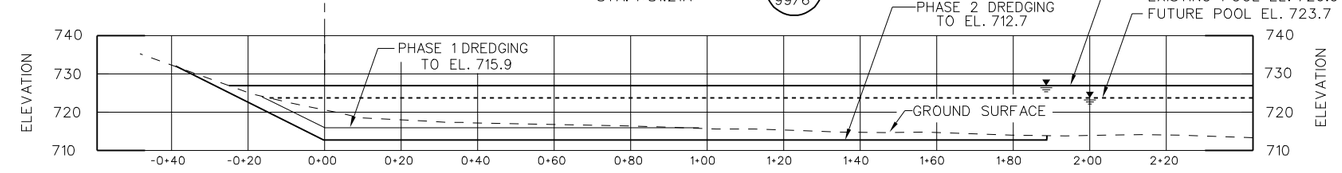

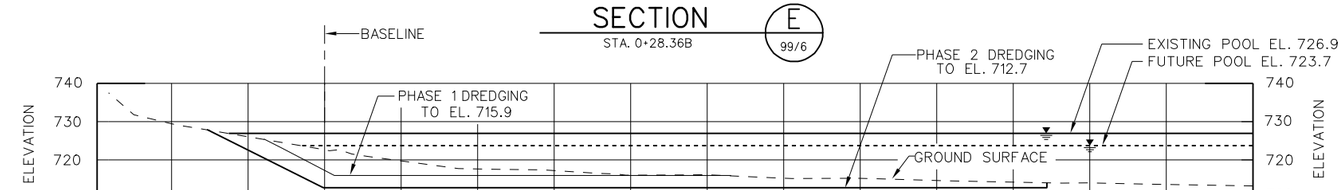

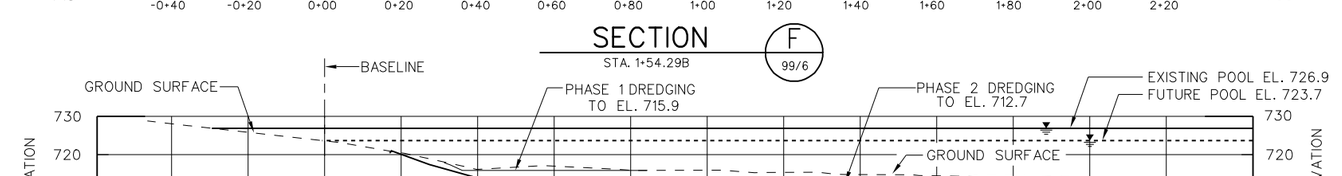

NOTE:
PHASE 2 DREDGING NOT IN THIS CONTRACT

20' 10' 0 20' 40'
SCALE: 1" = 20'

US Army Corps of Engineers
Pittsburgh District

Submitted by: /s/ BRIAN H. GREENE, P.G.
SECTION CHIEF
FEB NO.: W911WN

Design by: P. DONAHUE, P.E.
Dwn by: PJY
Ckd by: PJD
Submission Date: 2/27/04
Revision Date: X

User: brian.e.mcfarland
Date: 17-JUN-2004 14:57
Plot Scale: 0.166667'=1.000000
Pen Table: Color Table

Symbol	Description	Date	Appr.
5	SEC. A&B NOT USED-NEW DREDGE LIMITS-AMEND. NO. 5	17 JUN 04	BHG

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MONONGAHELA RIVER
CHARLEROI LOCKS AND DAM
LOCKS - CONTRACT #1
VICTORY HOLLOW SITE
DOCK DREDGING
SECTIONS

Drawing Number: 037-LCH-99/7.1

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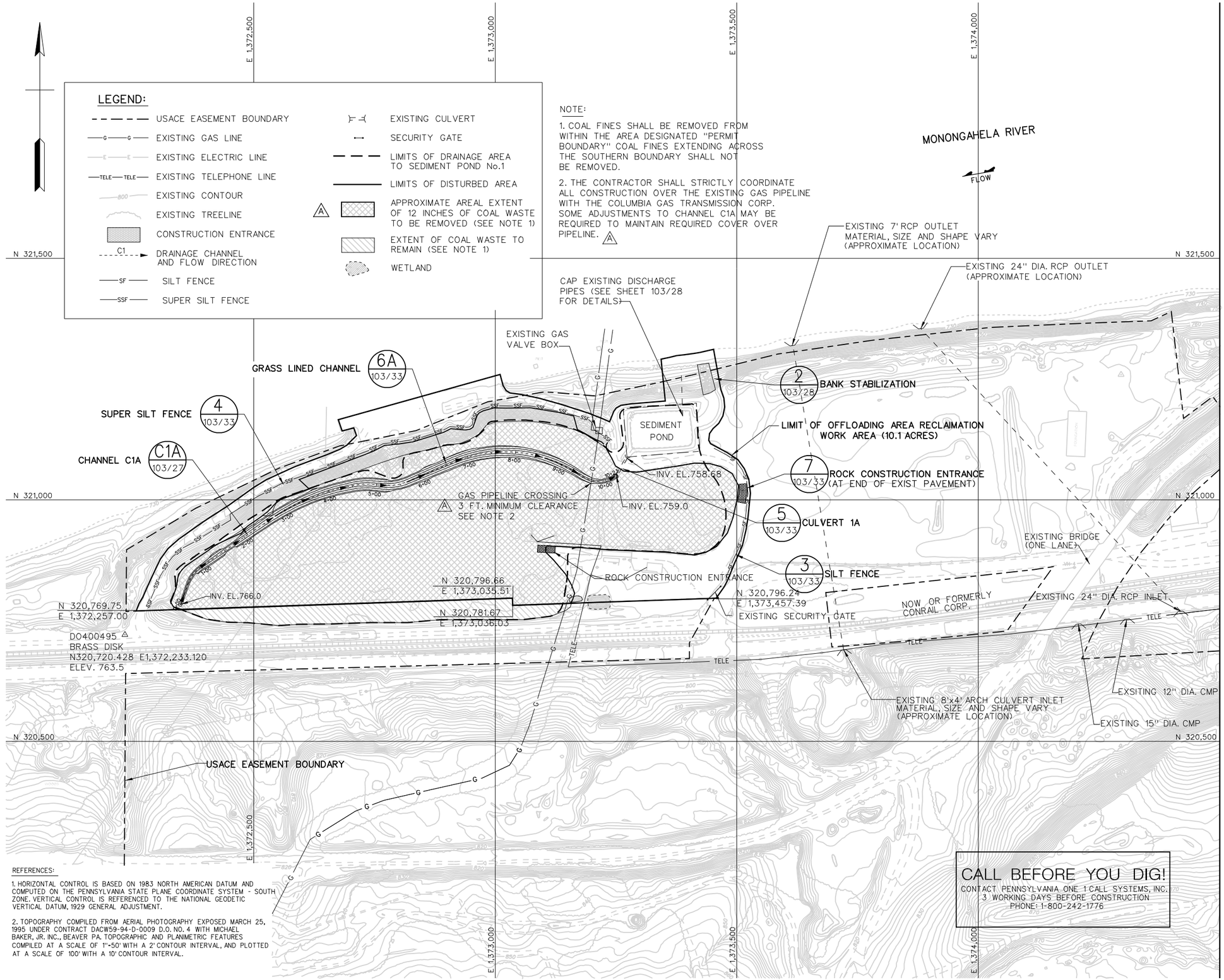

CONSTRUCTION SEQUENCE:

1. INSTALL CONSTRUCTION ENTRANCE WITH SECURITY GATE.
2. PROVIDE EQUIPMENT STORAGE AREA.
3. DISMANTLE CONVEYOR AND OTHER EQUIPMENT AT THE DOCK.
4. INSTALL SILT FENCE DOWNGRADIENT OF THE COAL FINE LIMITS.
5. CAP THE DISCHARGE PIPES IN THE SEDIMENT BASIN NO.1.
6. REMOVE THE EXISTING WATER AND SEDIMENT FROM BASIN AND DISPOSE IN A PERMITTED FACILITY. CONTINUE REMOVAL OF WATER AND SEDIMENT AND DISPOSE AT AN APPROVED TREATMENT FACILITY THROUGH DURATION OF RECLAIMATION ACTIVITY.
7. NO STORMWATER DISCHARGES FROM THE SITE WILL BE PERMITTED UNTIL ALL ACID-GENEATING MATERIAL IS REMOVED FROM THE AREA SHOWN, AND WATER QUALITY MONITORING INDICATES THE POND EFFLUENT LIMITATIONS, OUTLINED IN NPDES PERMIT #PA0218791, OUTFALL 001, ARE MET.
8. INSTALL CULVERT NO.1
9. CONSTRUCT RIPRAP APRONS.
10. INSTALL COLLECTION CHANNEL C1
11. CLEAR AND GRUB AREA.
12. REMOVE THE COAL FINES.
13. PLACE CLEAN DREDGED SEDIMENT IN THE AREA TO BRING THE AREA BACK TO GRADE.
14. VEGETATE ALL BARE AREAS.
15. BACKFILL CHANNEL C1A.
16. AFTER VEGETATION EXCEEDS A UNIFORM 70 PERCENT OF COVER, REMOVE TEMPORARY EROSION AND SEDIMENT CONTROLS.
17. SEPARATE EROSION AND SEDIMENT CONTROLS ARE REQUIRED FOR THE SITE DEVELOPMENT - SEE DRAWING 103/29.

PROFILE REPORT - CHANNEL C1

REACH	STATION	ELEVATION	CUT*	DISTANCE	SLOPE
A	0+00.00	766.00	2.36		
	1+00.00	765.32	3.74		-0.68%
	2+00.00	764.63	5.37		-0.68%
	3+00.00	763.95	6.05		-0.68%
	4+00.00	763.27	6.73		-0.68%
	5+00.00	762.58	7.42		-0.68%
	6+00.00	761.90	8.03		-0.68%
	7+00.00	761.21	6.99		-0.68%
	8+00.00	760.53	6.22		-0.68%
	9+00.00	759.85	5.11		-0.68%
	10+00.00	759.16	2.32		-0.68%
	10+23.90	759.00	1.48	1023.90	-0.68%

* DEPTH OF CUT IS FROM TOP OF EXISTING GRADE (COAL FINES)

REFERENCES:

1. HORIZONTAL CONTROL IS BASED ON 1983 NORTH AMERICAN DATUM AND COMPUTED ON THE PENNSYLVANIA STATE PLANE COORDINATE SYSTEM - SOUTH ZONE. VERTICAL CONTROL IS REFERENCED TO THE NATIONAL GEODETIC VERTICAL DATUM, 1929 GENERAL ADJUSTMENT.
2. TOPOGRAPHY COMPILED FROM AERIAL PHOTOGRAPHY EXPOSED MARCH 25, 1995 UNDER CONTRACT DACW59-94-D-0009 D.O. NO. 4 WITH MICHAEL BAKER, JR. INC., BEAVER PA. TOPOGRAPHIC AND PLANIMETRIC FEATURES COMPILED AT A SCALE OF 1"=50' WITH A 2' CONTOUR INTERVAL, AND PLOTTED AT A SCALE OF 100' WITH A 10' CONTOUR INTERVAL.

CALL BEFORE YOU DIG!
CONTACT PENNSYLVANIA ONE 1 CALL SYSTEMS, INC.
3 WORKING DAYS BEFORE CONSTRUCTION
PHONE: 1-800-242-1776

100' 50' 0 100' 200'
SCALE: 1" = 100'

US Army Corps of Engineers
Pittsburgh District

Submitted by: /s/ BRIAN H. GREENE, P.G. SECTION CHIEF
FEB NO.: W911WN
Design by: P. DONAHUE, P.E.
Dwn by: PJY
Ckd by: PJD
Submission Date: 2/27/04
Revision Date: X
User: brian.e.mcfarland
Date: 17-JUN-2004 14:57
Plot Scale: 0.166667 ft/000000
Pen Table: Color Table

Symbol	Description	Date	Appr.
1	REV. COAL WASTE LIMITS: ADD GAS PIPELINE INFO - AMEND. NO. 5	17 JUN 04	BHG

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MONONGAHELA RIVER
CHARLEROI LOCKS AND DAM
LOCKS - CONTRACT #1
VICTORY HOLLOW SITE
OFFLOADING AREA RECLAMATION
EROSION AND SEDIMENT CONTROL PLAN

Drawing Number: 037-LCH-103/26.1

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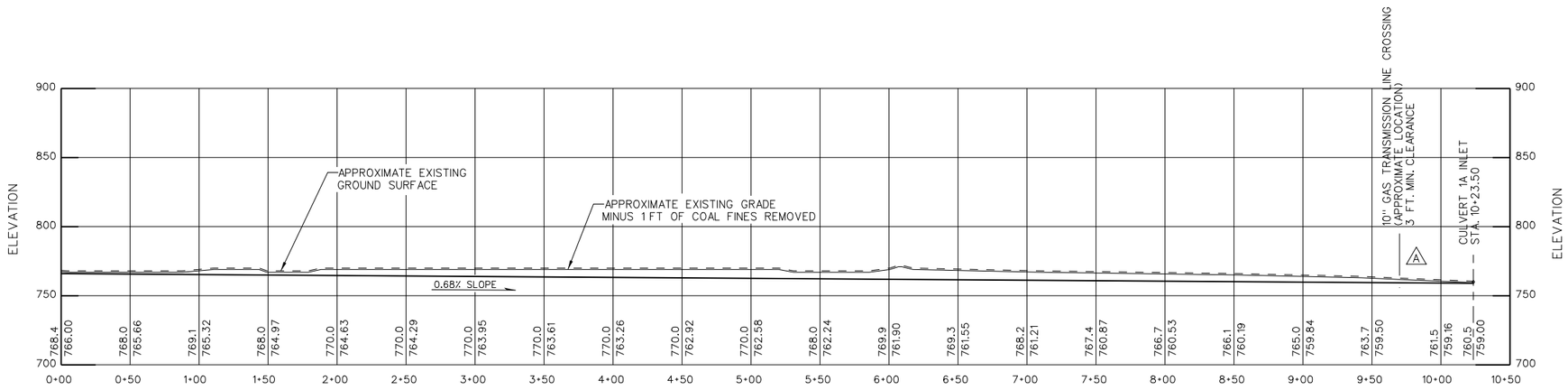

PROFILE

CHANNEL C1A

C1A
103/26

NOTE:

1. CHANNEL SLOPE MAY BE REDUCED TO 0.5 PERCENT IF NEEDED FOR GAS PIPELINE CLEARANCE. A

LEGEND:

- - - - - - EXISTING GROUND SURFACE

——— BOTTOM OF COAL FINES EXCAVATION (1 FT OF COAL FINES REMOVED)

——— INVERT OF CHANNEL

INVERT ELEVATION OF CHANNEL

767.4 / 760.87 — ELEVATION AT BOTTOM OF COAL FINES EXCAVATION

50' 25' 0 50' 100'

SCALE: 1" = 50'

US Army Corps of Engineers
Pittsburgh District

Submitted by: /s/ BRIAN H. GREENE, P.G. SECTION CHIEF
Design by: P. DONAHUE, P.E.
Dwn by: PJY
Ckd by: PJD
Submission Date: 2/27/04
Revision Date: X
FB NO.: W911WN

User: brian.e.mcfarland
Date: 17-JUN-2004 14:57
Plot Scale: 0.166667 ft/000000
Pen Table: Color Table

Symbol	Description	Date	Appr.
A	ADD GAS PIPELINE INFO. - AMEND. NO. 5	17 JUN 04	BHG

F:\M-Char Lock-C1\sheet\AM5\A3027A-b-3.s01

MONONGAHELA RIVER
CHARLEROI LOCKS AND DAM
LOCKS - CONTRACT #1
VICTORY HOLLOW SITE
OFFLOADING AREA RECLAMATION
CHANNEL C1 PROFILE

Drawing Number: 037-LCH-103/27.1

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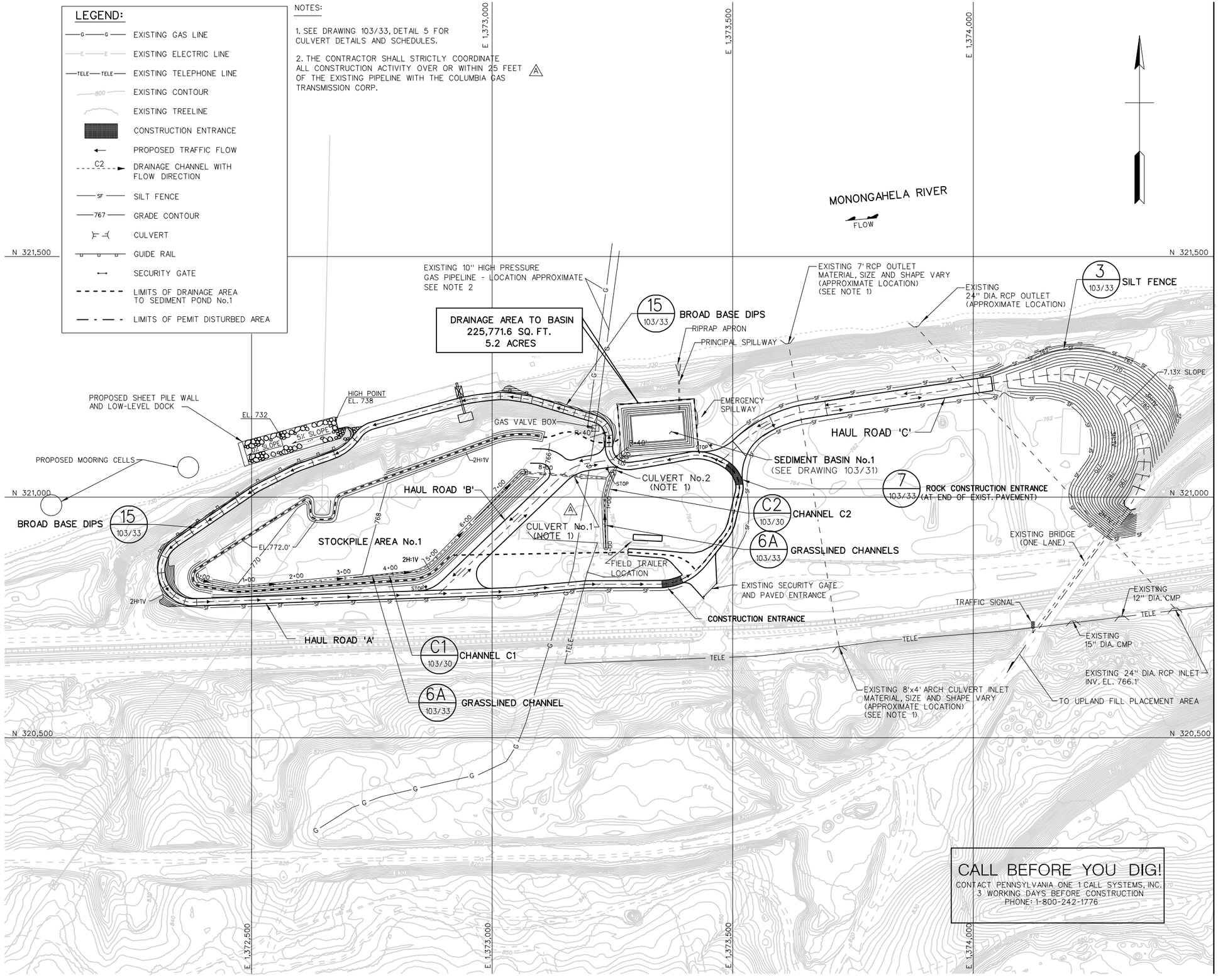

CONSTRUCTION SEQUENCE:

1. INSTALL CONSTRUCTION ENTRANCES WITH SECURITY GATES.
2. PROVIDE EQUIPMENT STORAGE AREA.
3. MOBILIZE FIELD OFFICE TRAILER AND CONNECT UTILITIES.
4. INSTALL SILT FENCE AT LOCATIONS SHOWN.
5. DISMANTLE DOCK CONVEYOR EQUIPMENT AND PERFORM ALL DOCK REPAIRS INCLUDING ACCESS IMPROVEMENTS AND DREDGING SHOWN ON SHEETS 99/9 AND 99/10.
6. CONSTRUCT CONTAINMENT DIKE FOR STOCKPILE AREA.
7. MODIFY SEDIMENT BASIN No.1.
8. INSTALL CULVERTS 1 AND 2.
9. CONSTRUCT RIPRAP SPILLWAY APRONS.
10. INSTALL COLLECTION CHANNELS C1 AND C2.
11. CLEAR AND GRUB ROADWAY AREAS.
12. GRADE HAUL ROADS A, B, AND C INCLUDING THE RAMP TO THE BRIDGE.
13. PLACE GRAVEL SURFACE ON HAUL ROADS.
14. PLACE GRAVEL SURFACING IN STOCKPILE AREA IF NEEDED TO FACILITATE EQUIPMENT ACCESS.
15. VEGETATE THE RAMP EMBANKMENT, THE STOCKPILE AREA BERM AND ALL OTHER AREAS DISTURBED BY CONSTRUCTION.

SITE CLOSURE SEQUENCE:

AT END OF CONTRACT:

1. VEGETATE ALL REMAINING BARE AREAS AND STOCKPILE AREAS #1 AND #2.
2. WHEN VEGETATION REACHES AT LEAST 70% UNIFORM COVER:
a. REMOVE ALL ACCUMULATED SEDIMENT FROM SEDIMENT BASIN AND DISPOSE OFF-SITE.
b. REPAIR AND LEAVE ALL DRAINAGE FEATURES AND EROSION AND SEDIMENT CONTROL MEASURES IN PLACE.

US Army Corps of Engineers
Pittsburgh District

Submitted by: /s/ BRIAN H. GREENE, P.G. SECTION CHIEF
FEB NO.: W911WN
Design by: P. DONAHUE, P.E.
Dwn by: PJY
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Submission Date: 2/27/04
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User: brian.e.mcfarland
Date: 17-JUN-2004 14:57
Plot Scale: 0.166667 ft/000000
Pen Table: Color Table

Symbol	Description	Date	Appr.
	GAS PIPE NOTE, SHORTEN CULV. #1 TO AVOID PIPLINE - AMEND. NO. 5	17 JUN 04	BHG

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MONONGAHELA RIVER
CHARLEROI LOCKS AND DAM
LOCKS - CONTRACT #1
VICTORY HOLLOW SITE
OFFLOADING AREA
EROSION AND SEDIMENT CONTROL PLAN

Drawing Number: 037-LCH-103/29.1

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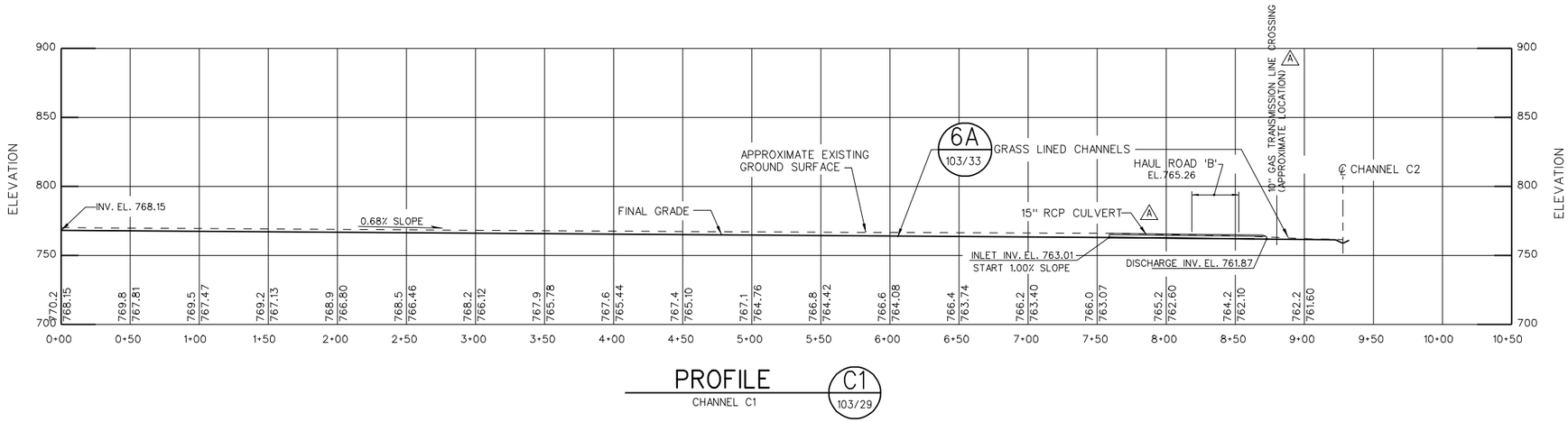
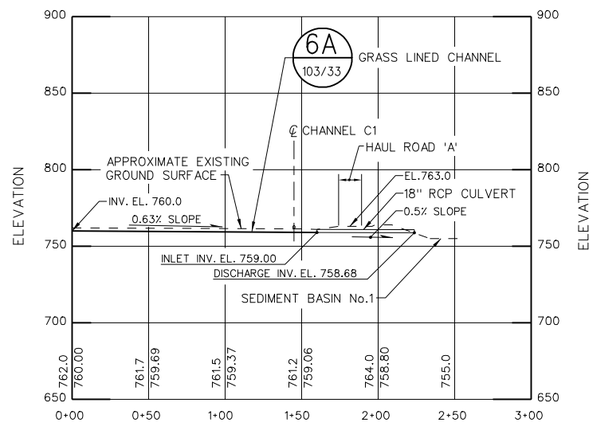


PROFILE
CHANNEL C1 — C1 / 103/29



PROFILE
CHANNEL C2 — C2 / 103/29

50' 25' 0 50' 100'
SCALE: 1" = 50'

US Army Corps of Engineers
Pittsburgh District

Submitted by: /s/ BRIAN H. GREENE, P.G. SECTION CHIEF
FEB NO.: W911WN
Design by: P. DONAHUE, P.E.
Dwn by: PJY
Ckd by: PJD
Submission Date: 2/27/04
Revision Date: X
User: brian.e.mcfarland
Date: 17-JUN-2004 14:57
Plot Scale: 0.166667:1.000000
Pen Table:
Color Table

Symbol	Description	Date	Appr.
1	SHORTEN CULV. #1 TO AVOID GAS LINE; ADD GAS PIPELINE INFO. - AMEND. NO. 5	17 JUN 04	BHG

F:\M-Char Lock-C1\sheet\AM5\A3030A-b-5.s01

MONONGAHELA RIVER
CHARLEROI LOCKS AND DAM
LOCKS - CONTRACT #1
VICTORY HOLLOW SITE
OFFLOADING AREA
CHANNELS C1 AND C2 PROFILES

Drawing Number: 037-LCH-103/30.1

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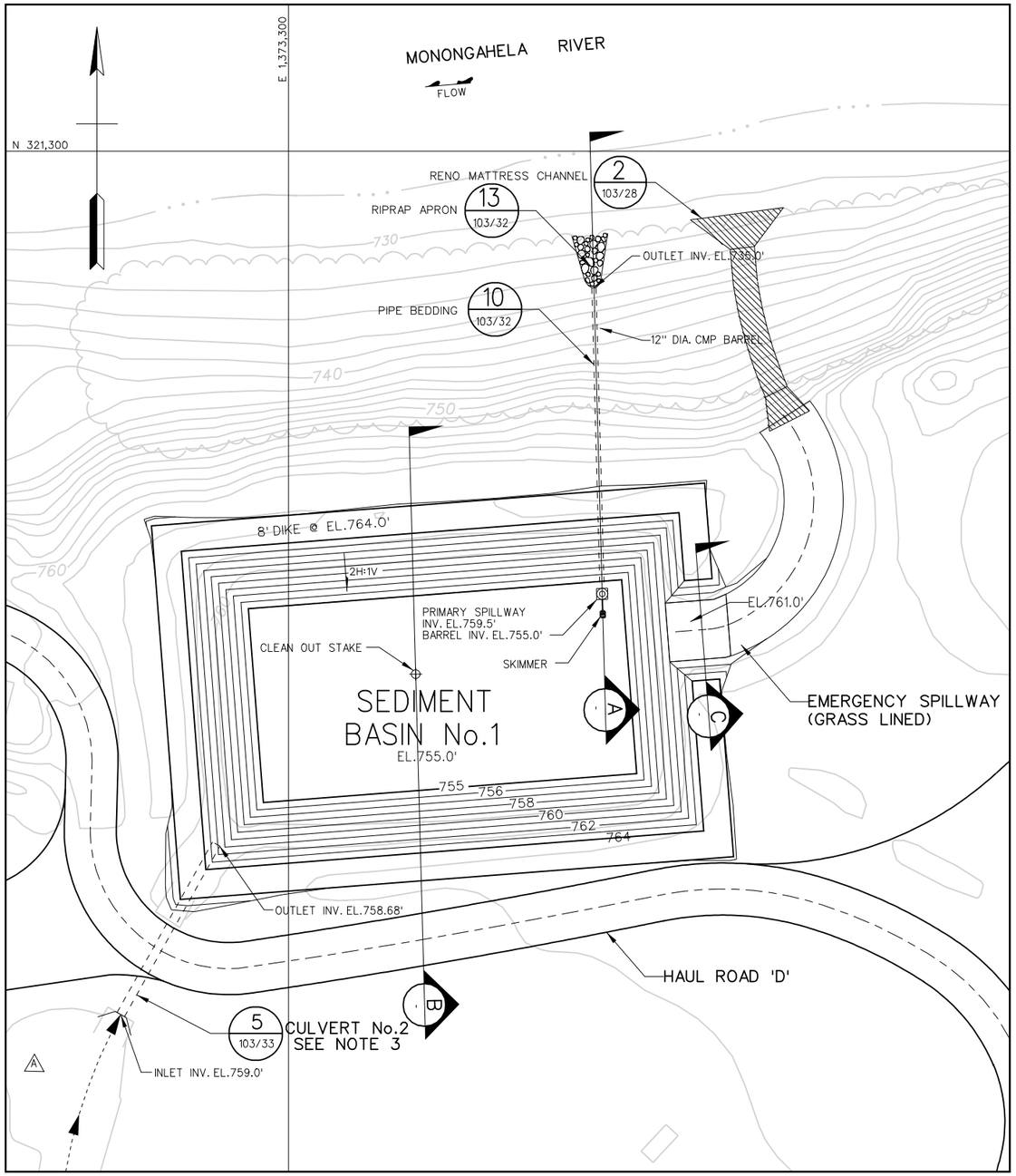
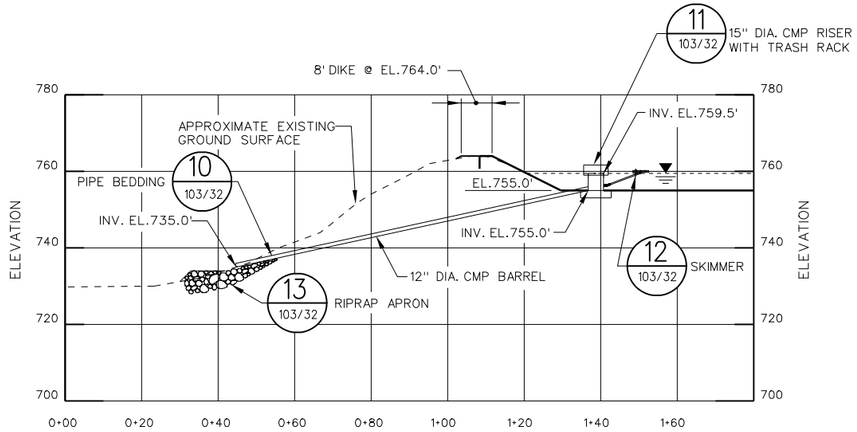
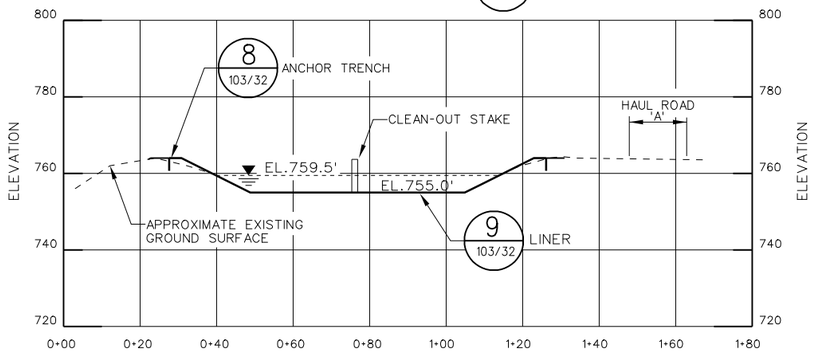


ENLARGED PLAN VIEW - SEDIMENT BASIN No.1

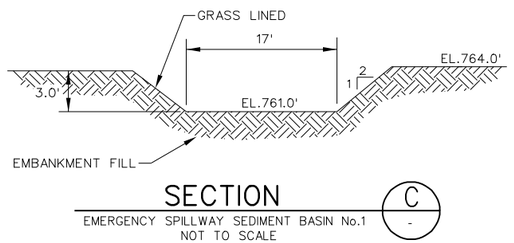
REFERENCE:
"TYPICAL SEDIMENT POND DESIGN DETAIL",
AMERICAN CARBON & METALS CORP.,
DECEMBER 1991, REV. MAY 1992, NO SCALE.



SECTION A
SEDIMENT BASIN No.1



SECTION B
SEDIMENT BASIN No.1



SECTION C
EMERGENCY SPILLWAY SEDIMENT BASIN No.1
NOT TO SCALE

SEDIMENT BASIN No.1	
DRAINAGE AREA (ACRES)	5.2
REQUIRED CAPACITY (CF)	23,920
AVAILABLE CAPACITY (CF)	32,500
SIDE SLOPES (H:V)	2:1
TOP OF EMBANKMENT ELEVATION	764.0'
CREST OF PRINCIPAL SPILLWAY ELEVATION	759.5'
CLEAN-OUT ELEVATION	756.0'
BOTTOM ELEVATION	755.0'
TOP WIDTH OF BASIN (FT.)	99'
TOP LENGTH OF BASIN (FT.)	144'
TOTAL DEPTH OF BASIN (FT.)	9'
EMERGENCY SPILLWAY WIDTH (FT.)	17'

MAINTENANCE NOTES:

1. INSPECT ALL SEDIMENT BASINS ON AT LEAST A WEEKLY BASIS AND AFTER EACH RUN-OFF EVENT.

2. PROVIDE ACCESS FOR SEDIMENT REMOVAL AND OTHER REQUIRED MAINTENANCE ACTIVITIES.

3. REMOVE SEDIMENT AND RESTORE THE BASIN TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO THE LEVEL SHOWN ON THE SEDIMENT CLEAN-OUT STAKE LOCATED NEAR THE CENTER OF THE BASIN. DISPOSE OF THE MATERIALS REMOVED FROM THE BASIN IN THE MANNER DESCRIBED IN THE E&S PLAN.

4. REPAIR CLOGGED OR DAMAGED SPILLWAYS IMMEDIATELY.

5. REMOVE TRASH AND OTHER DEBRIS FROM THE BASIN AND RISER.

6. CHECK BASIN EMBANKMENTS, SPILLWAYS, AND OUTLETS FOR EROSION, PIPING AND SETTLEMENT. MAKE NECESSARY REPAIRS IMMEDIATELY.

7. REPLACE DISPLACED RIPRAP WITHIN THE OUTLET ENERGY DISSIPATOR IMMEDIATELY AFTER IT IS DISPLACED AND ESPECIALLY AFTER MAJOR STORM DISCHARGE EVENTS.

NOTES:

1. GUIDE STAKES SHALL BE INSTALLED TO PREVENT THE SKIMMER FROM MOVING SIDE TO SIDE. A DEVICE TO PREVENT THE SKIMMER FROM SETTLING BELOW THE TOP OF SEDIMENT STORAGE ZONE SHOULD ALSO BE INSTALLED.

2. A CLEAN-OUT STAKE SHALL BE PLACED NEAR THE CENTER OF EACH BASIN. ACCUMULATED SEDIMENTS SHALL BE REMOVED WHEN IT HAS REACHED THE CLEAN OUT ELEVATION ON THE STAKE.

3. CULVERT #2 IS SAME CULVERT AS CULVET#1A INSTALLED FOR SITE RECLAIMATION, EXCEPT CONTRACTOR SHALL DETAIL AND FURNISH A PIPE-PENETRATION INTO NEW POND LINER.

20' 10' 0 20' 40'
SCALE: 1" - 20'

US Army Corps of Engineers
Pittsburgh District

Submitted by: SECTION CHIEF
FFB NO.: W911WN
Design by: P. DONAHUE, P.E.
Ckd by: PJD
Revision Date: X
Dwn by: PJY
Submission Date: 2/27/04
User: brian.e.mcfarland
Date: 17-JUN-2004 14:57
Plot Scale: 0.166667:1.000000
Pen Table:
Color Table

Symbol	Description	Date	Appr.
1	DEL CULV. #1 OUTLET FROM THIS DWG. - AMEND. NO. 5	17 JUN 04	BHG

F:\M-Char Lock-C1\sheet\AM5\A30.31A-b-3.s01

MONONGAHELA RIVER
CHARLEROI LOCKS AND DAM
LOCKS - CONTRACT #1
VICTORY HOLLOW SITE
OFFLOADING AREA
SENIMENT BASIN No. 1

Drawing Number:
037-LCH-103/31.1

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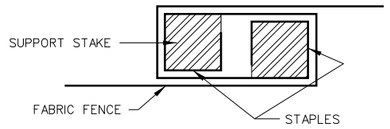


JOINING FENCE SECTIONS

GENERAL NOTES FOR SILT FENCE INSTALLATION:

1. STAKES SPACED AT 8' MAXIMUM. USE 2" x 2" WOOD OR EQUIVALENT STEEL STAKES.

2. FILTER FABRIC FENCE MUST BE PLACED AT LEVEL EXISTING GRADE. BOTH ENDS OF THE BARRIER MUST BE EXTENDED AT LEAST 8 FEET UP SLOPE AT 45 DEGREES TO THE MAIN BARRIER ALIGNMENT.

3. SEDIMENT MUST BE REMOVED WHEN ACCUMULATIONS REACH 1/2 THE ABOVE GROUND HEIGHT OF FENCE.

4. ANY SECTION OF FILTER FABRIC FENCE WHICH HAS BEEN UNDERMINED OR TOPPED MUST BE IMMEDIATELY REPLACED WITH A ROCK FILTER OUTLET. SEE CONSTRUCTION DETAIL 10, THIS DRAWING.

STANDARD EROSION AND SEDIMENTATION CONTROL PLAN NOTES

1. ONLY LIMITED DISTURBANCE WILL BE PERMITTED TO PROVIDE ACCESS TO THE SEDIMENT BASIN AND CHANNELS FOR GRADING AND ACQUIRING BORROW TO CONSTRUCT THOSE CONTROLS.

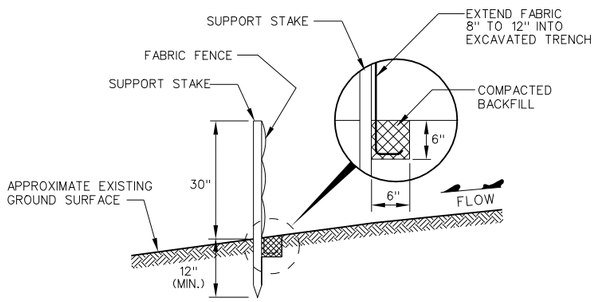
2. EROSION AND SEDIMENTATION CONTROLS MUST BE CONSTRUCTED, STABILIZED AND FUNCTIONAL BEFORE SITE DISTURBANCE WITHIN THE TRIBUTARY AREAS OF THOSE CONTROLS.

3. AFTER FINAL SITE STABILIZATION HAS BEEN ACHIEVED, TEMPORARY EROSION AND SEDIMENTATION CONTROLS MUST BE REMOVED. AREAS DISTURBED DURING REMOVAL OF THE CONTROLS MUST BE STABILIZED IMMEDIATELY.

4. STOCKPILE HEIGHTS MUST NOT EXCEED 35 FEET. STOCKPILE SLOPES MUST BE 2:1 OR FLATTER.

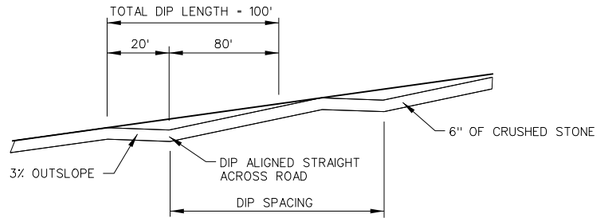
5. ANY DISTURBED AREA ON WHICH ACTIVITY HAS CEASED AND WHICH WILL REMAIN EXPOSED FOR MORE THAN 20 DAYS MUST BE STABILIZED IMMEDIATELY. DURING NON-GERMINATING PERIODS, MULCH MUST BE APPLIED AT THE RECOMMENDED RATES.

6. UNTIL THE SITE IS STABILIZED, ALL EROSION AND SEDIMENTATION CONTROLS MUST BE MAINTAINED PROPERLY. MAINTENANCE MUST INCLUDE INSPECTIONS OF ALL EROSION AND SEDIMENTATION CONTROLS AFTER EACH RUNOFF EVENT AND ON A WEEKLY BASIS. ALL PREVENTATIVE AND REMEDIAL MAINTENANCE WORK, INCLUDING CLEAN OUT, REPAIR, REPLACEMENT, REGRADING, RESEEDING, REMULCHING AND RENETTING, MUST BE PERFORMED IMMEDIATELY.

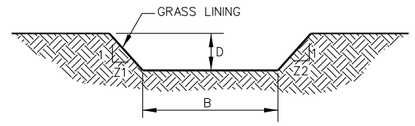


SECTION VIEW

DETAIL — SILT FENCE — NOT TO SCALE — 3 / 103/26 — 3 / 103/29

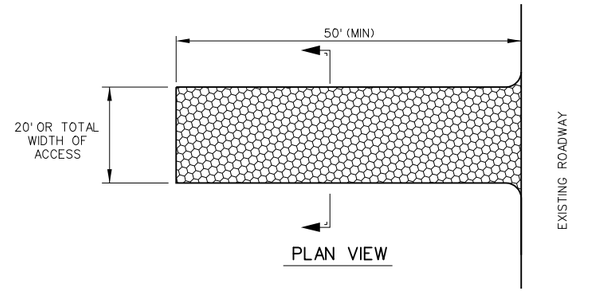


DETAIL — BROAD BASE DIPS — NOT TO SCALE — 15 / 103/29

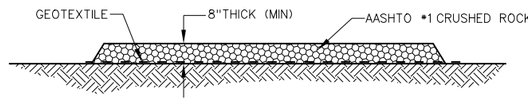


DETAIL — GRASS LINED CHANNEL — NOT TO SCALE — 6A / 103/26 — 6A / 103/29 — 6A / 103/30

CHANNEL DIMENSION TABLE							
CHANNEL	REACH	B	D	Z1	Z2	t	LINING
C1A	A	1.0'	2.0'	2:1	2:1	-	GRASS LINED
C1	A	1.0'	2.0'	2:1	2:1	-	GRASS LINED
C2	A	1.0'	2.0'	2:1	2:1	-	GRASS LINED

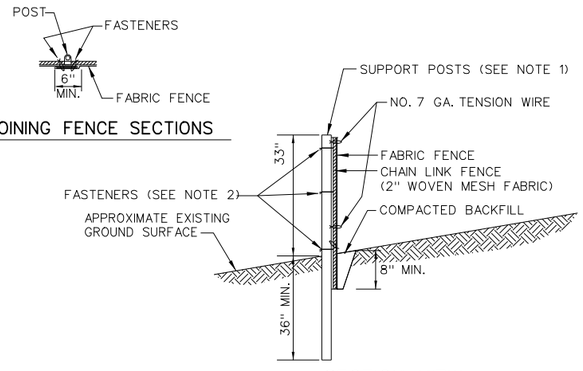


PLAN VIEW



SECTION

DETAIL — ROCK CONSTRUCTION ENTRANCE — NOT TO SCALE — 7 / 99/2 — 7 / 103/26 — 7 / 103/29



JOINING FENCE SECTIONS

SECTION VIEW

GENERAL NOTES FOR SUPER SILT FENCE INSTALLATION:

1. POSTS SPACED @ 10' MAX. USE 2 1/2" DIA. GALVANIZED OR ALUMINUM POSTS.

2. CHAIN LINK TO POST FASTENERS SPACED @ 14" MAX. USE NO. 6 GA. ALUMINUM WIRE OR NO. 9 GALVANIZED STEEL PRE-FORMED CLIPS. CHAIN LINK TO TENSION WIRE FASTENERS SPACED @ 60" MAX. USE NO. 10 GA. GALVANIZED STEEL WIRE. FABRIC TO CHAIN FASTENERS SPACED @ 24" MAX. C TO C.

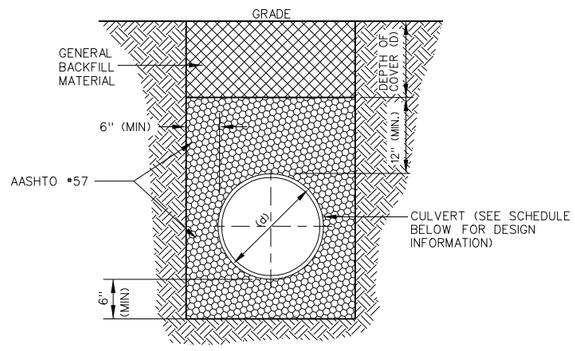
3. NO. 7 GA. TENSION WIRE INSTALLED HORIZONTALLY AT TOP AND BOTTOM OF CHAIN-LINK FENCE.

4. FILTER FABRIC FENCE MUST BE PLACED AT EXISTING LEVEL GRADE. BOTH ENDS OF THE BARRIER MUST BE EXTENDED AT LEAST 8 FEET UPSLOPE AT 45 DEGREES TO THE MAIN BARRIER ALIGNMENT.

5. SEDIMENT MUST BE REMOVED WHEN ACCUMULATIONS REACH 1/2 THE ABOVE GROUND HEIGHT OF THE FENCE.

DETAIL — SUPER SILT FENCE — NOT TO SCALE — 4 / 103/26

SPACING OF BROAD BASED DIPS	
ROAD GRADE %	SPACING (FT)
2	300
3	250
4	200
5	180
6	170
7	160
8	150
9-10	140



NOTE:

WHERE CULVERT CROSSES UNDER HAUL ROAD REPLACE THE TOP 6" OF GEN. BACKFILL WITH 6" OF COMPACTED PENNDOT OGS AGGREGATE

CULVERT NO.	CONTRIBUTING CHANNEL & REACH	FLOWRATE Q (cfs)	SLOPE S* (ft/ft)	PIPE DIAMETER (d) (in)	QUANTITY	INVERT ELEV LENGTH (ft.)	INVERT ELEV INLET (ft.)	INVERT ELEV OUTLET (ft.)	MATERIAL	DEPTH OF COVER (D) (in)
1A	C1A	9.4	0.0068	18	1	55'	759.0	758.68	CONCRETE	12"(MIN)
1	C1	6.9	0.010	15	1	114'	763.01	761.87	CONCRETE	12"(MIN)
2*	C1 & C2	12.4	0.0063	18	1	55'	759.0	758.68	CONCRETE	12"(MIN)

A

* SAME CULVERT AS CULVERT 1A INSTALLED DURING COAL FINES REMOVAL

DETAIL — TYPICAL CULVERT BEDDING DETAIL — NOT TO SCALE — 5 / 103/26 — 5 / 103/29 — 5 / 103/29

MULCHING AND ADDITIVE REQUIREMENTS	
TYPE	APPLICATION RATE
MULCH: GRASS HAY/CEREAL STRAW	1200 lbs/1000 sy
LIME: PULVERIZED AGRICULTURAL LIMESTONE	800 lbs/1000 sy
FERTILIZER: 10-20-20	140 lbs/1000 sy

SEEDING SCHEDULE - SLOPES 3H:1V OR FLATTER						
FORMULA AND SPECIES (PENNDOT FORMULA B)	% SEED BY WEIGHT	MINIMUM % PURITY	MINIMUM % GERM.	MAXIMUM % WEED SEED	SEEDING RATE (LBS/1000 SY)	SEEDING DATES
KENTUCKY BLUEGRASS (POA PRATENSIS)	50	98	80	0.20	11.0	MARCH 15 TO JUNE 1 OR AUGUST 1 TO OCTOBER 15
CREEPING RED/CHEWING FESCUE	30	98	85	0.15	6.0	
PERENNIAL RYE (LOLIUM PERENNE)	20	98	90	0.15	4.0	

A

SEEDING SCHEDULE - SLOPES STEEPER THAN 3H:1V						
FORMULA AND SPECIES (PENNDOT FORMULA C)	% SEED BY WEIGHT	MINIMUM % PURITY	MINIMUM % GERM.	MAXIMUM % WEED SEED	SEEDING RATE (LBS/1000 SY)	SEEDING DATES
ANNUAL RYE (LOLIUM MULTIFLORUM)	55	98	90	0.15	5.0	MARCH 1 TO OCT 15
CROWN VETCH (CORONILLA VARIA)	45	99	70	0.10	4.0	ANYTIME EXC. SEPT. & OCT.

A

US Army Corps of Engineers
Pittsburgh District

Submitted by: /s/ BRIAN H. GREENE, P.G. SECTION CHIEF
FB NO.: W911WN
Design by: P. DONAHUE, P.E.
Dwn by: PJY
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Submission Date: 2/27/04
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Date: 17-JUN-2004 14:55
Plot Scale: 0.166667 ft/1.000000
Pen Table: Color Table

Symbol	Description	Date	Appr.
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E:\M-Char Lock-C1\sheet\AM5\A30334-b-3.s01

MONONGAHELA RIVER
CHARLEROI LOCKS AND DAM
LOCKS - CONTRACT #1
VICTORY HOLLOW SITE
OFFLOADING AND UPLAND FILL PLACEMENT FACILITY
EROSION AND SEDIMENT CONTROL DETAILS

Drawing Number: 037-LCH-103/33.1

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